

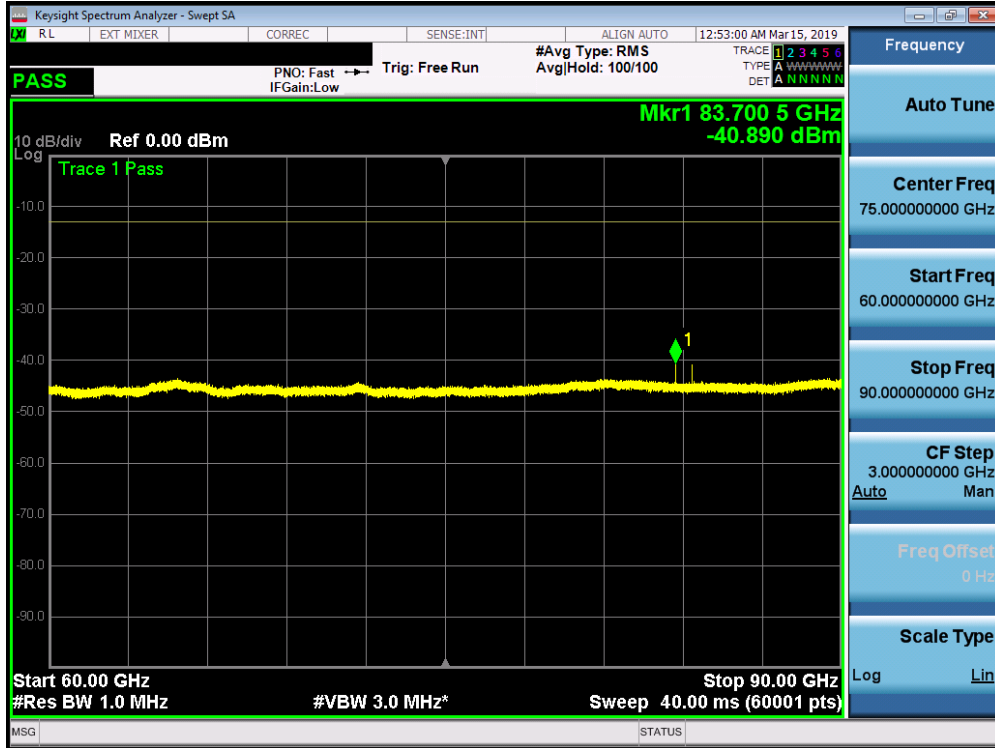


Plot 7-141. K Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK High Channel H Beam)



Plot 7-142. K Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Low Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 109 of 337



Plot 7-143. K Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Mid Channel V Beam)



Plot 7-144. K Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 110 of 337

## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} + \text{Harmonic Mixer Loss (dB)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	EUT Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
82539.00	RMS/Avg	Low	50	QPSK	H	V	150	317	-42.98	-13.00	-29.98
83700.50	RMS/Avg	Mid	50	QPSK	H	V	150	360	-43.08	-13.00	-30.08
84892.50	RMS/Avg	High	50	QPSK	H	V	150	298	-42.51	-13.00	-29.51
82539.00	RMS/Avg	Low	50	QPSK	V	H	150	335	-40.11	-13.00	-27.11
83700.50	RMS/Avg	Mid	50	QPSK	V	H	150	310	-40.89	-13.00	-27.89
84893.00	RMS/Avg	High	50	QPSK	V	H	150	311	-39.06	-13.00	-26.06

**Table 7-28. K Patch Spurious Emissions Table (60-90GHz)**

### Notes

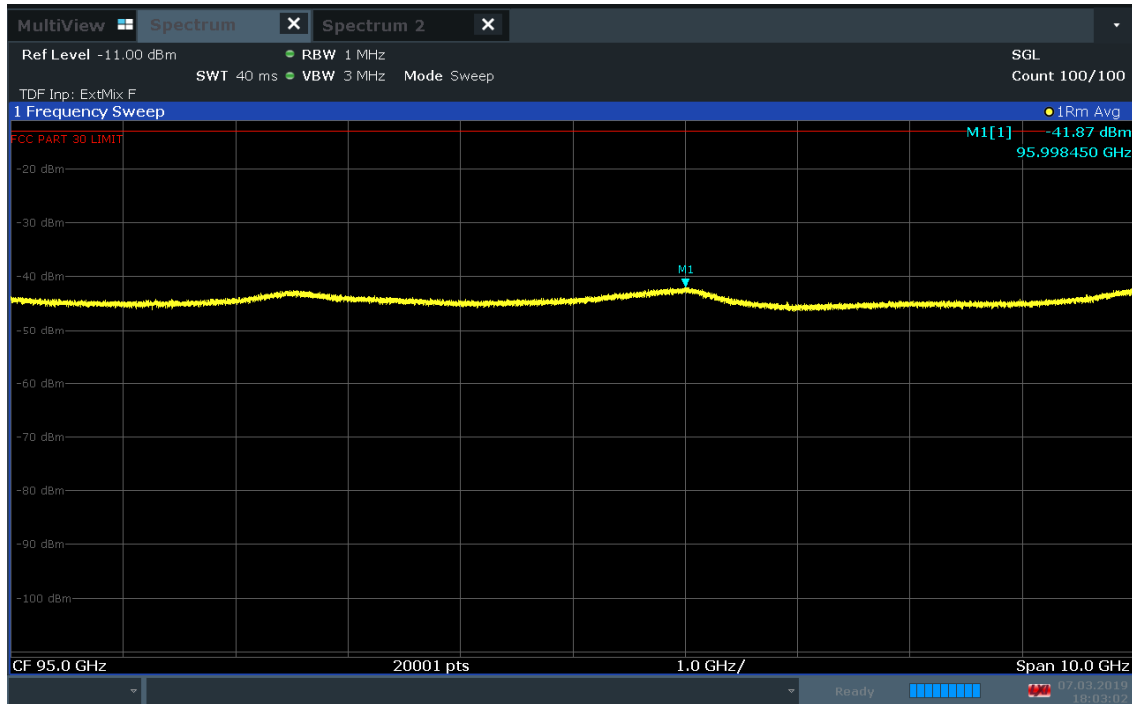
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-42.51 \text{ dBm} + -39.06 \text{ dBm}) = (56.10 \text{ nW} + 124.17 \text{ nW}) = (180.27 \text{ nW}) = -37.44 \text{ dBm}$$

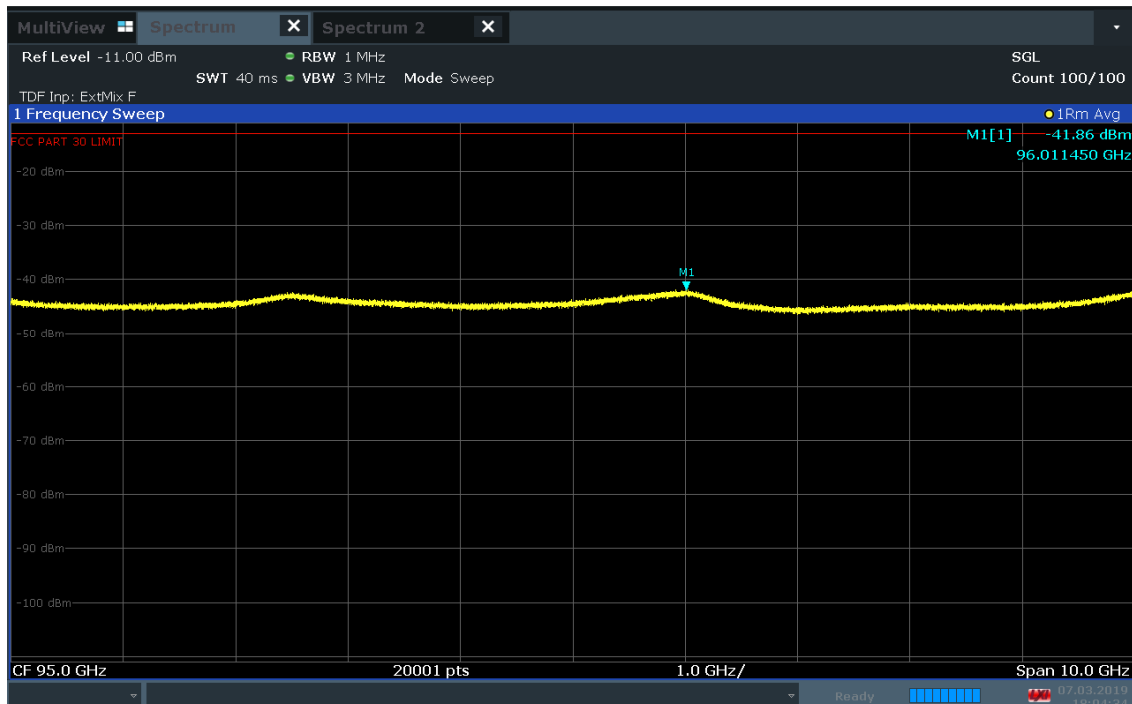
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset	Page 111 of 337	

ACLRResults



Plot 7-145. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Low Channel H Beam)

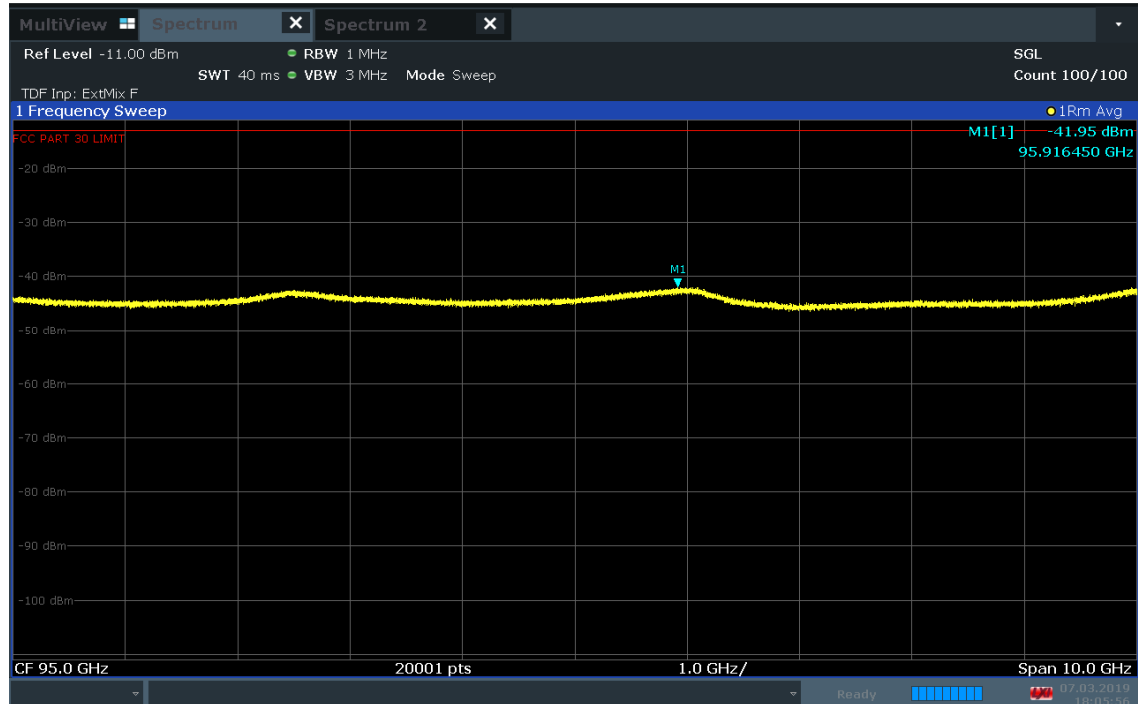
ACLRResults



Plot 7-146. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Mid Channel H Beam)

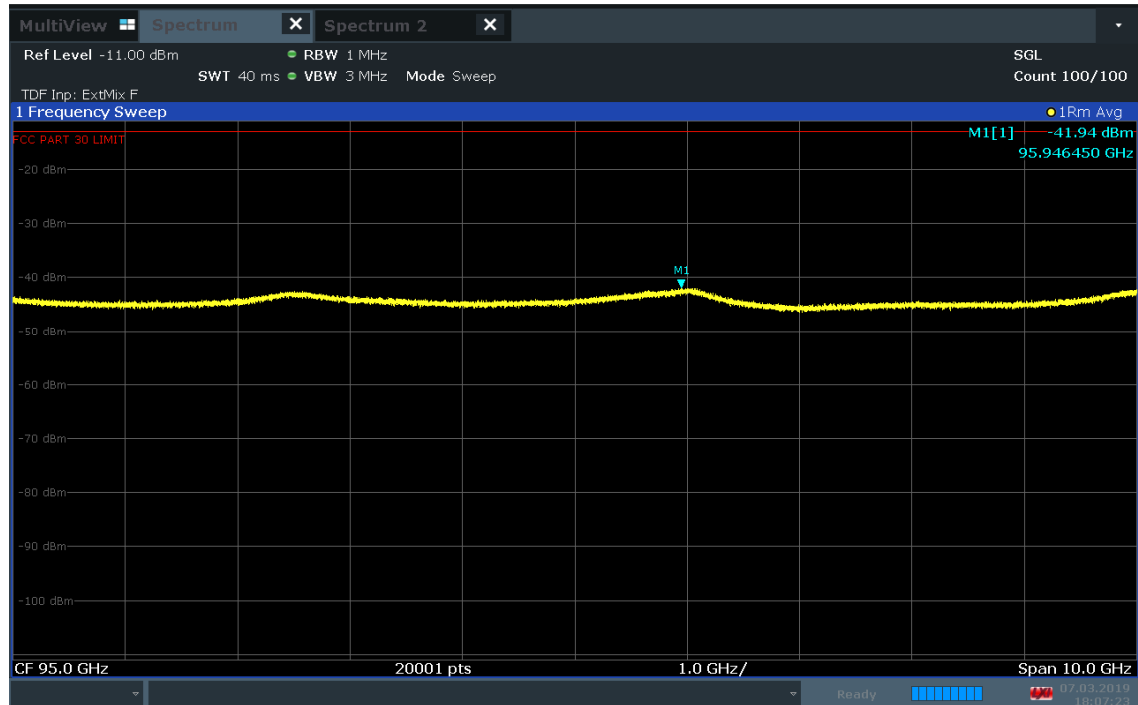
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 112 of 337

ACLRResults



Plot 7-147. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK High Channel H Beam)

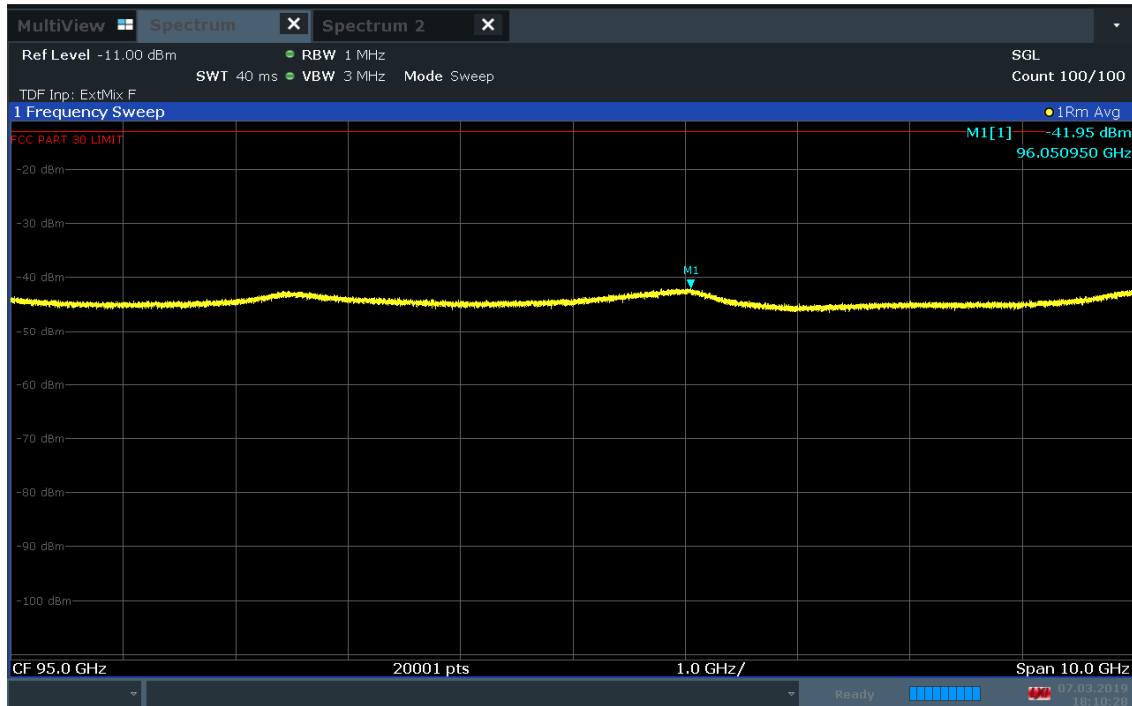
ACLRResults



Plot 7-148. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Low Channel V Beam)

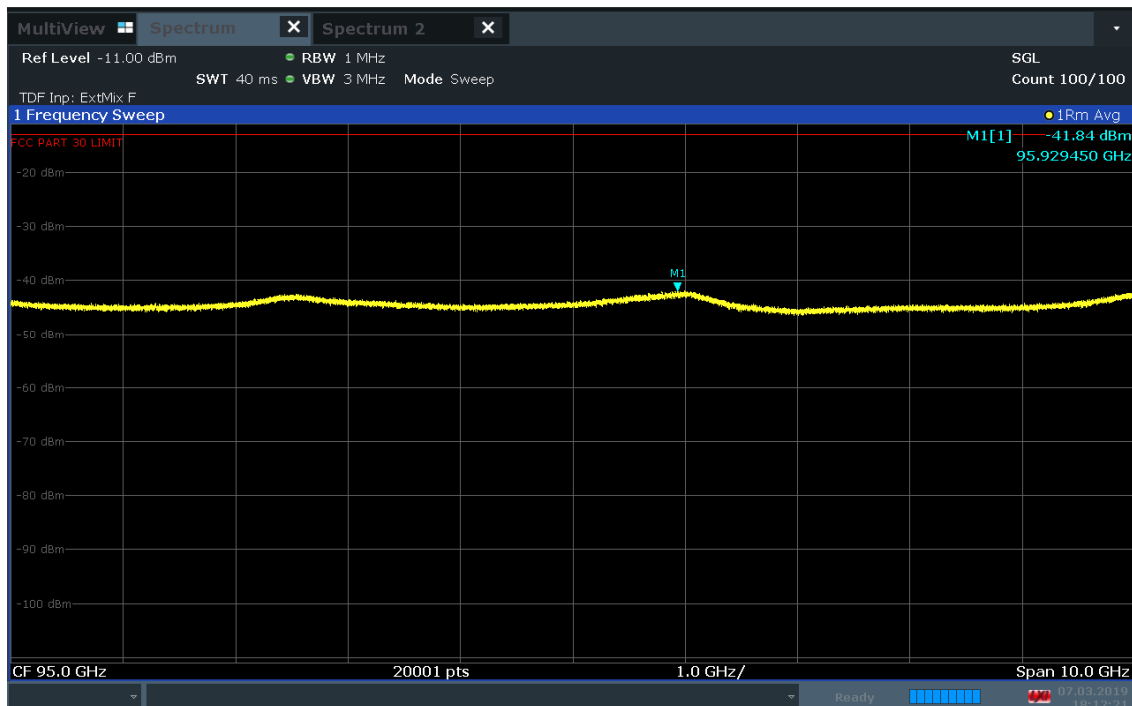
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 113 of 337

ACLRResults



Plot 7-149. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Mid Channel V Beam)

ACLRResults



Plot 7-150. K Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 114 of 337

## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} + \text{Harmonic Mixer Loss (dB)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
95998.45	RMS/Avg	Low	50	QPSK	H	H	-	-	-41.87	-13.00	-28.87
96011.45	RMS/Avg	Mid	50	QPSK	H	H	-	-	-41.86	-13.00	-28.86
95916.45	RMS/Avg	High	50	QPSK	H	H	-	-	-41.95	-13.00	-28.95
95946.45	RMS/Avg	Low	50	QPSK	V	V	-	-	-41.94	-13.00	-28.94
96050.95	RMS/Avg	Mid	50	QPSK	V	V	-	-	-41.95	-13.00	-28.95
95929.45	RMS/Avg	High	50	QPSK	V	V	-	-	-41.84	-13.00	-28.84

**Table 7-29. K Patch Spurious Emissions Table (90-100GHz)**

### Notes

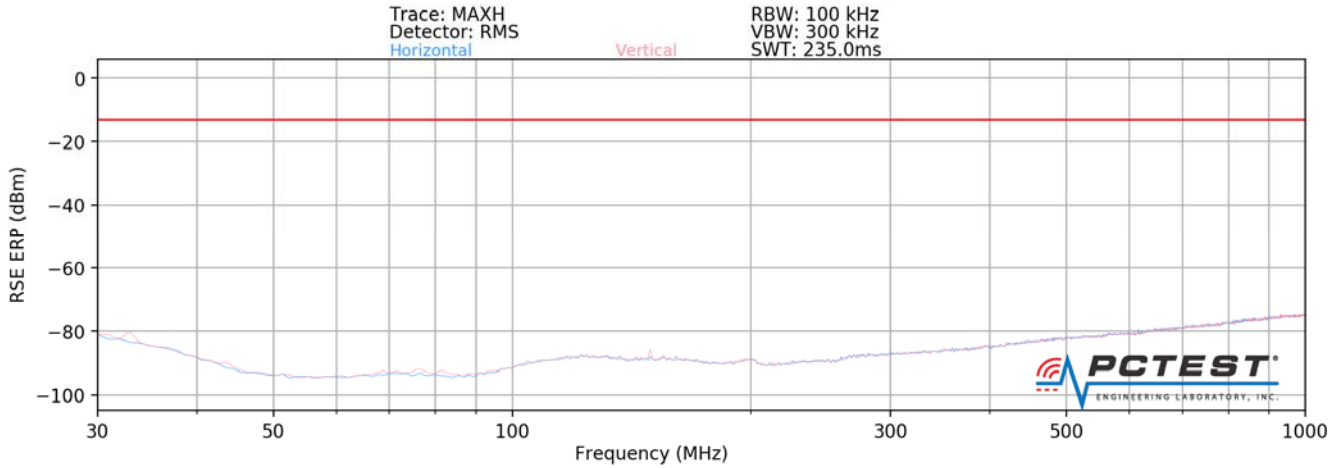
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

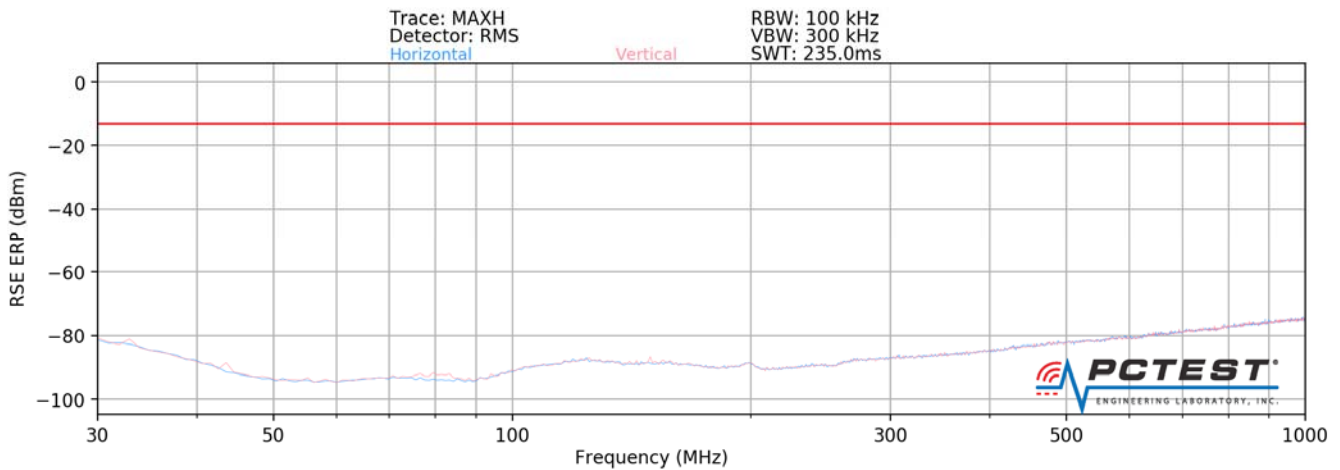
$$(-41.95 \text{ dBm} + -41.84 \text{ dBm}) = (63.83 \text{ nW} + 65.46 \text{ nW}) = (129.29 \text{ nW}) = -38.88 \text{ dBm}$$

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset	Page 115 of 337	

### 7.4.4 L Patch Radiated Spurious Emissions 30MHz – 1GHz



**Plot 7-151. L Patch Radiated Spurious Plot 30 MHz - 1 GHz (1CC QPSK Mid Channel H Beam)**

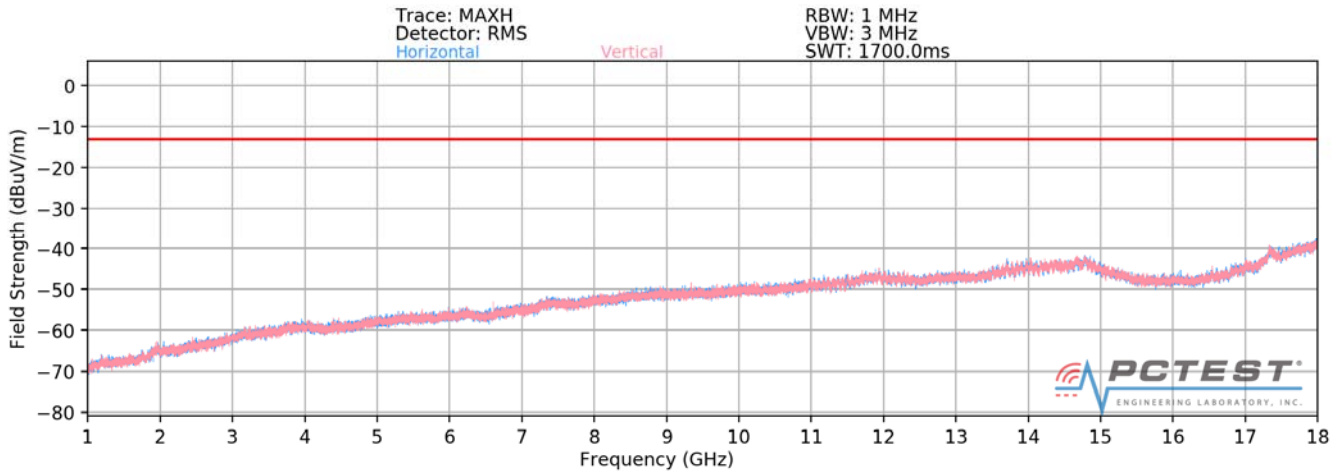


**Plot 7-152. L Patch Radiated Spurious Plot 30 MHz - 1 GHz (1CC QPSK Mid Channel V Beam)**

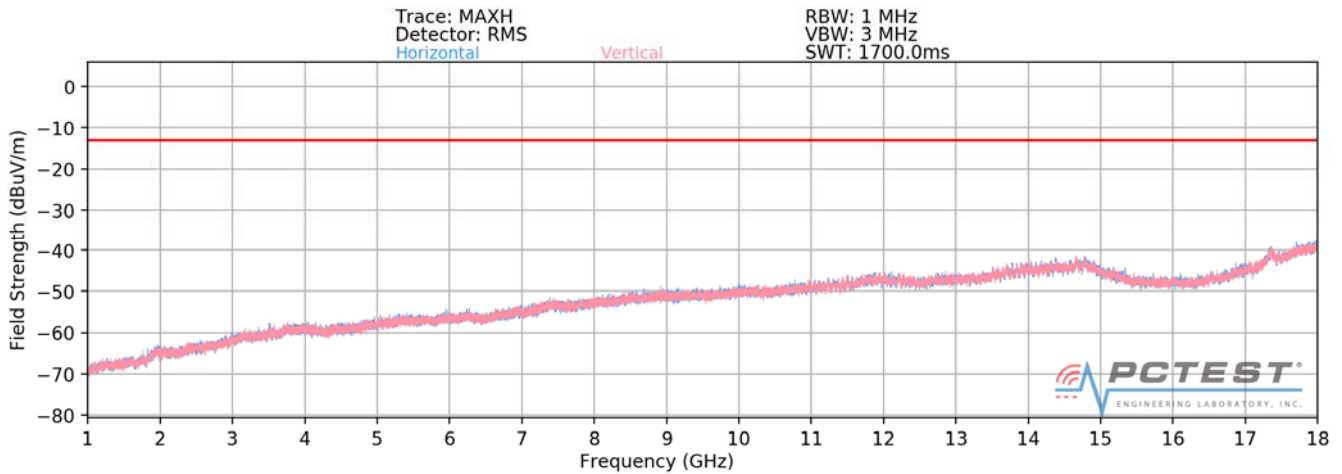
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 116 of 337



**1 – 18GHz**



**Plot 7-153. L Patch Radiated Spurious Plot 1-18 GHz (1CC QPSK Mid Channel H Beam)**

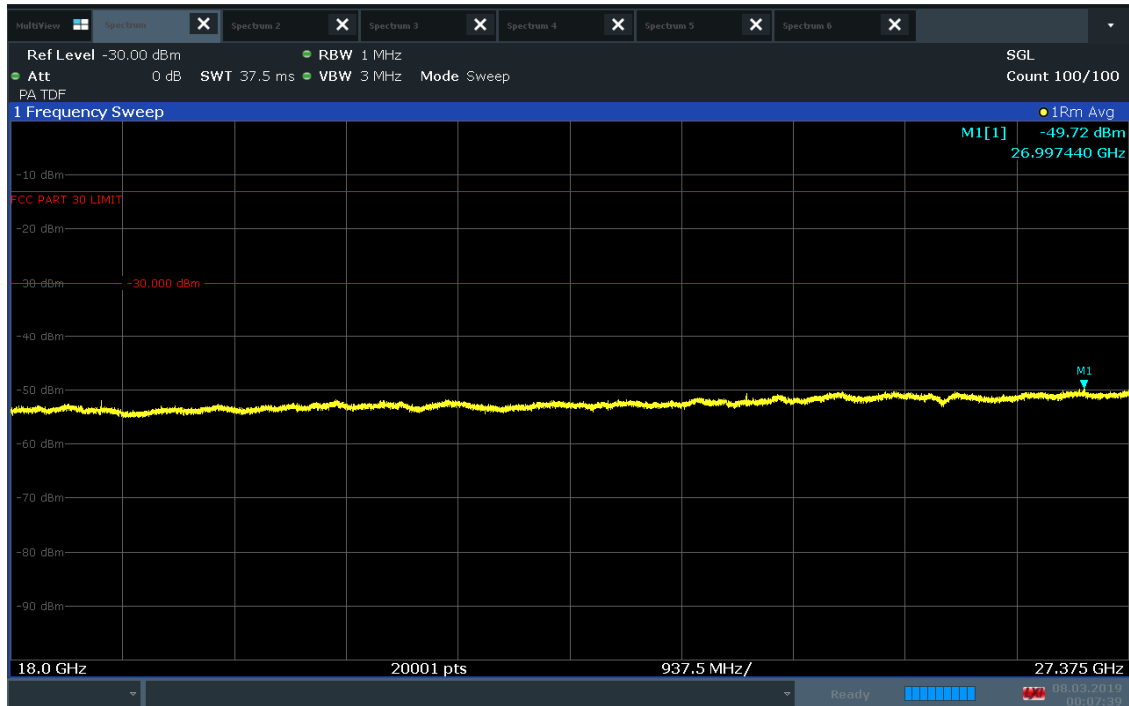


**Plot 7-154. L Patch Radiated Spurious Plot 1-18 GHz (1CC QPSK Mid Channel V Beam)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 117 of 337

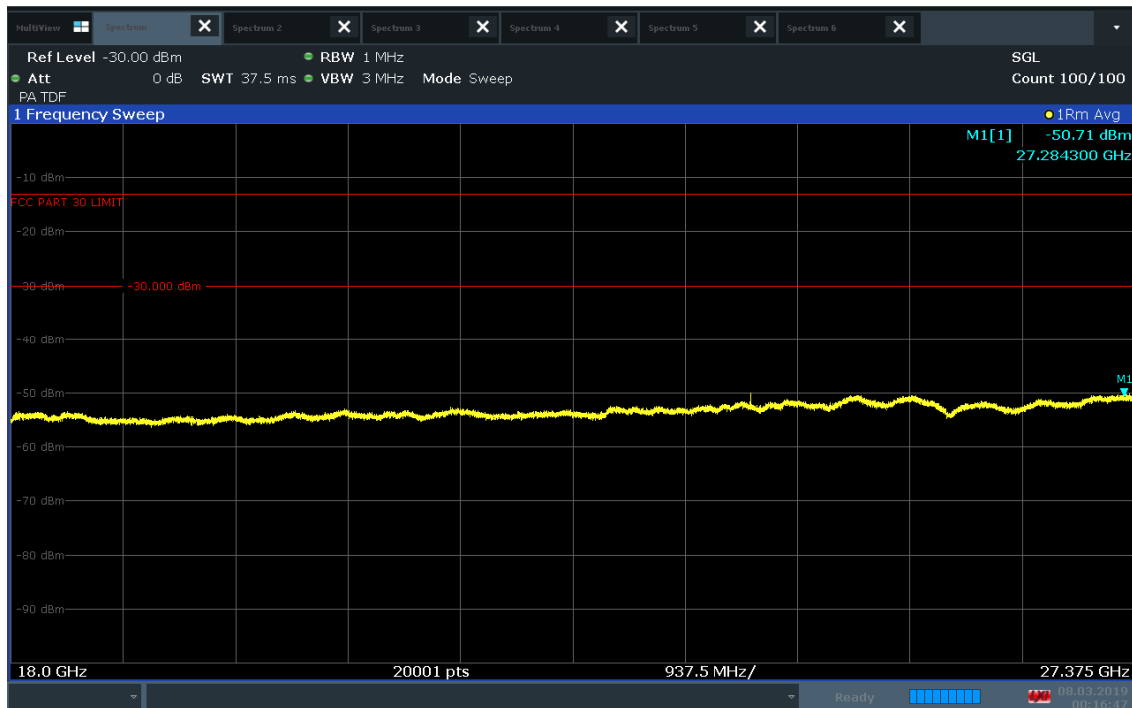
18 – 27.375GHz

ACLRRResults



Plot 7-155. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK Low Channel H Beam)

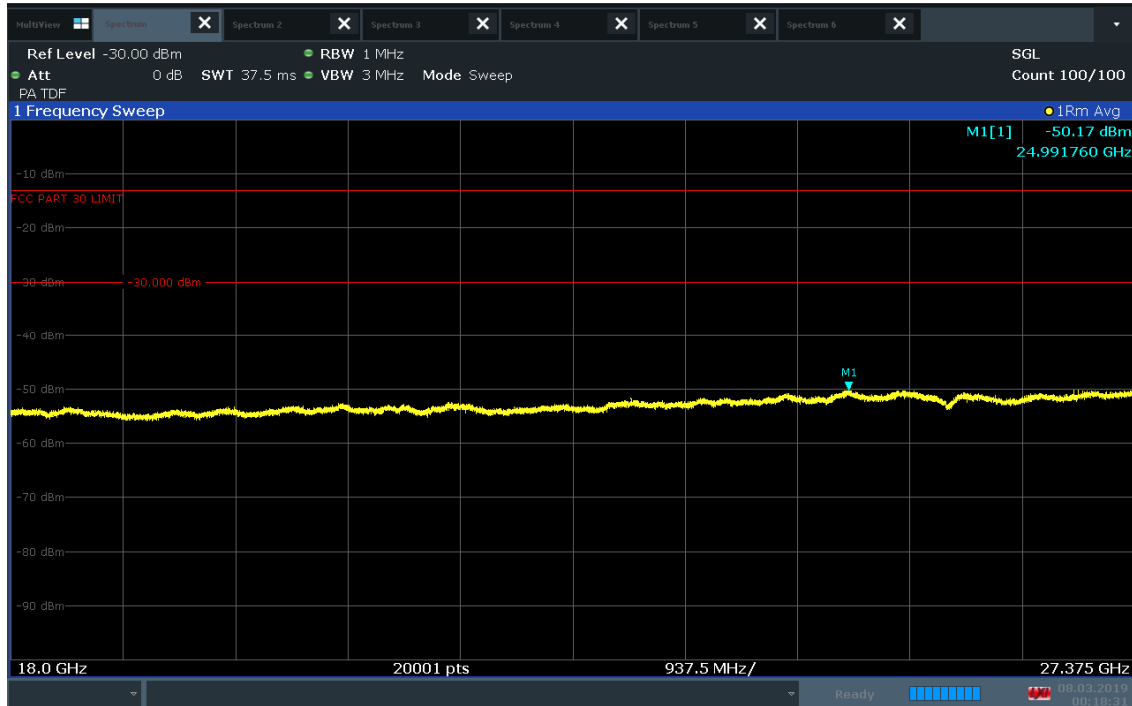
ACLRRResults



Plot 7-156. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK Mid Channel H Beam)

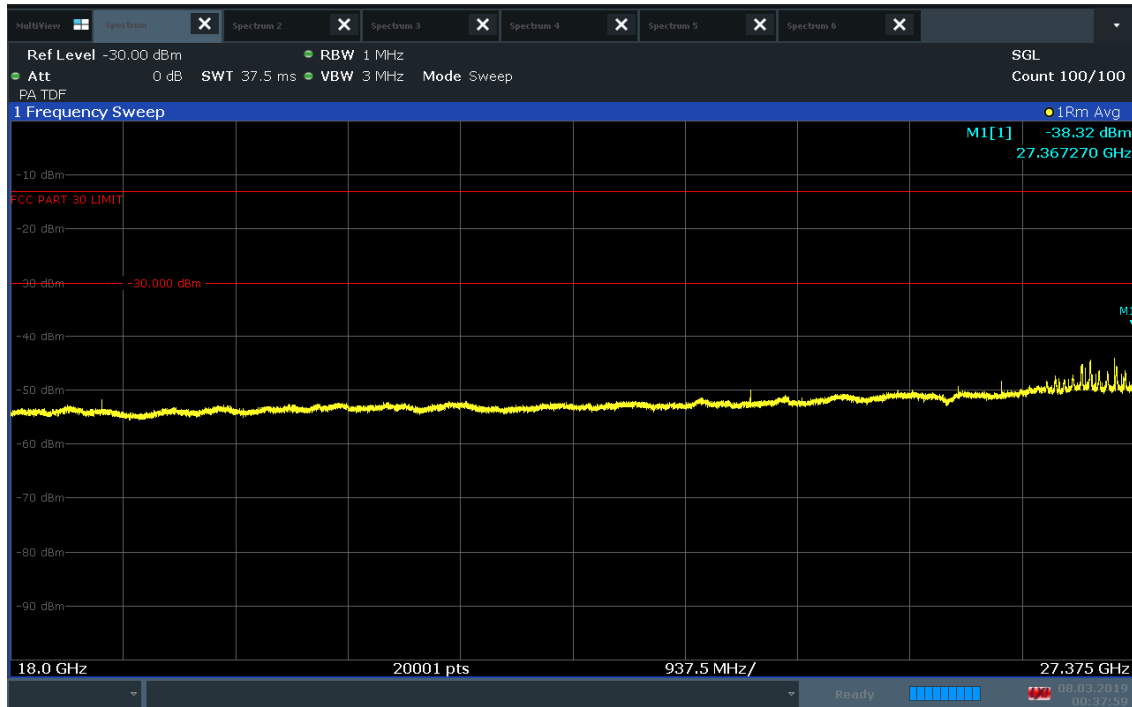
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 118 of 337

ACLRResults



Plot 7-157. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK High Channel H Beam)

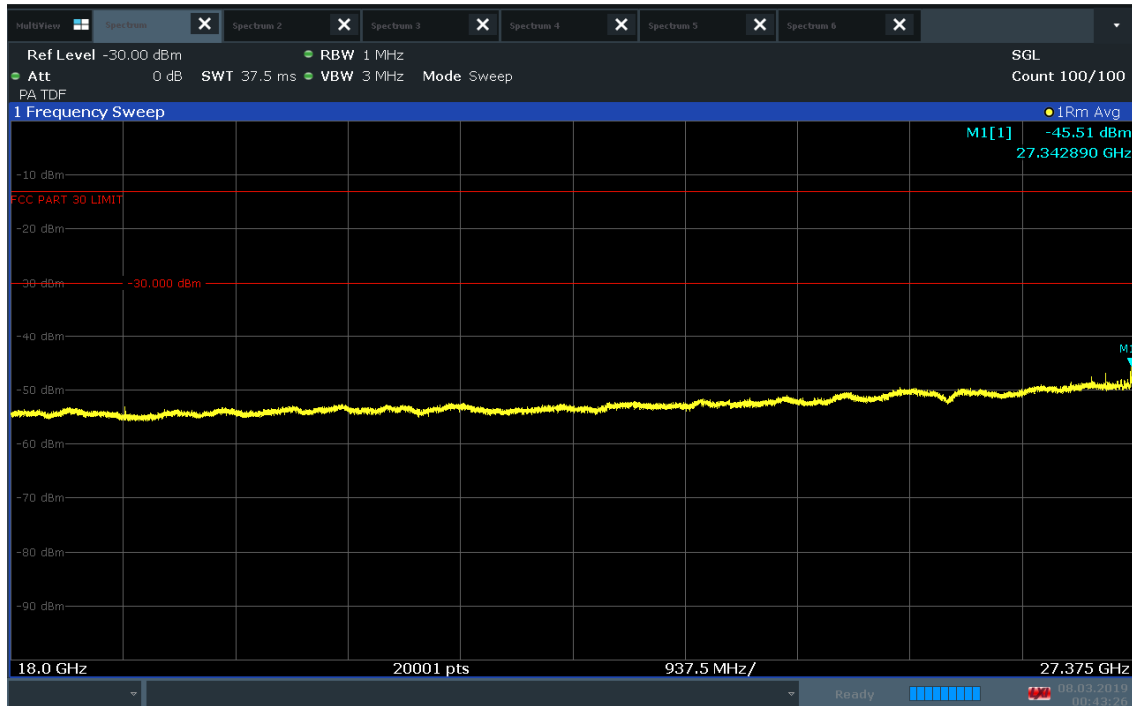
ACLRResults



Plot 7-158. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK Low Channel V Beam)

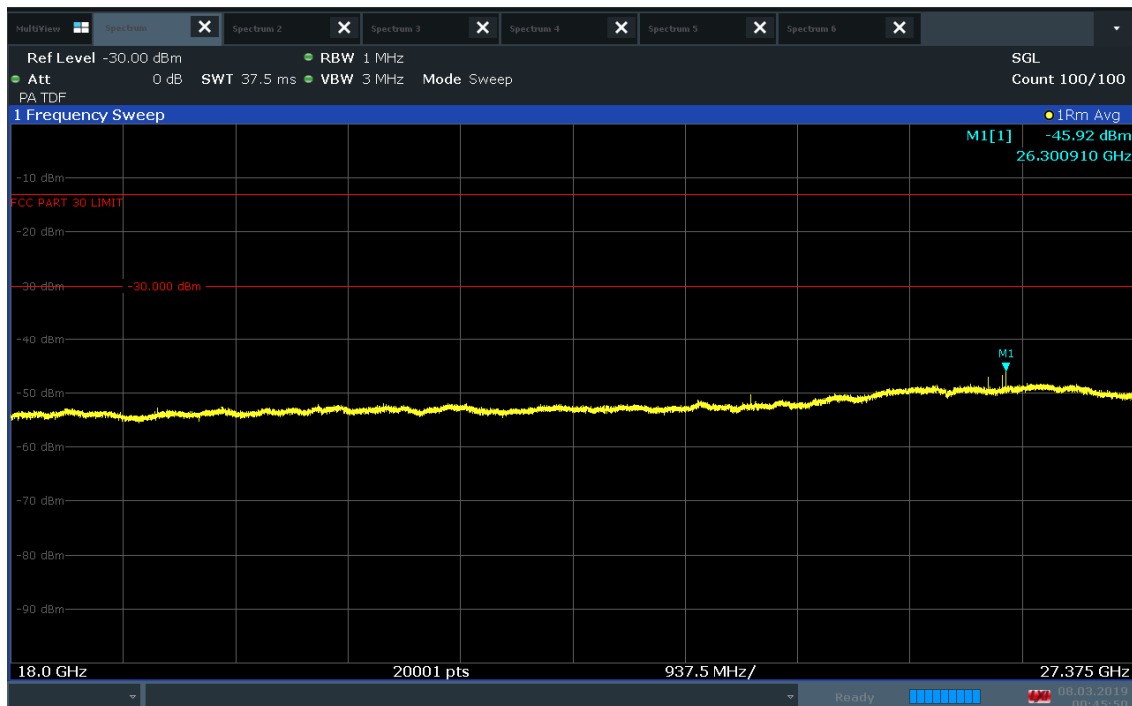
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 119 of 337

ACLRResults



Plot 7-159. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK Mid Channel V Beam)

ACLRResults



Plot 7-160. L Patch Radiated Spurious Plot 18-27.375 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 120 of 337

## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	EUT Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
26997.44	RMS/Avg	Low	50	QPSK	H	V	150	316	-49.72	-13.00	-36.72
27284.30	RMS/Avg	Mid	50	QPSK	H	V	150	33	-50.71	-13.00	-37.71
24991.76	RMS/Avg	High	50	QPSK	H	V	150	102	-50.17	-13.00	-37.17
27367.27	RMS/Avg	Low	50	QPSK	V	V	150	335	-38.32	-13.00	-25.32
27342.89	RMS/Avg	Mid	50	QPSK	V	V	150	292	-45.51	-13.00	-32.51
26300.91	RMS/Avg	High	50	QPSK	V	V	150	342	-45.92	-13.00	-32.92

**Table 7-30. L Patch Spurious Emissions Table (18-27.375GHz)**

### Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

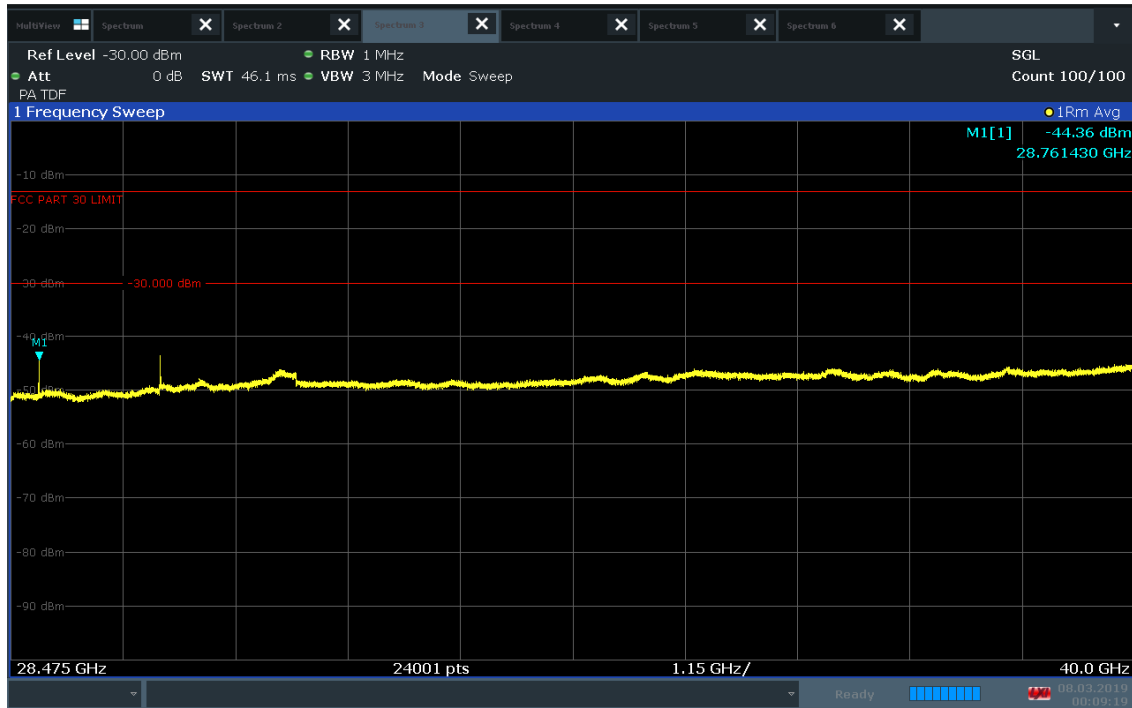
$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-49.72 \text{ dBm} + -38.32 \text{ dBm}) = (10.67 \text{ nW} + 147.23 \text{ nW}) = (157.90 \text{ nW}) = -38.02 \text{ dBm}$$

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset	Page 121 of 337	

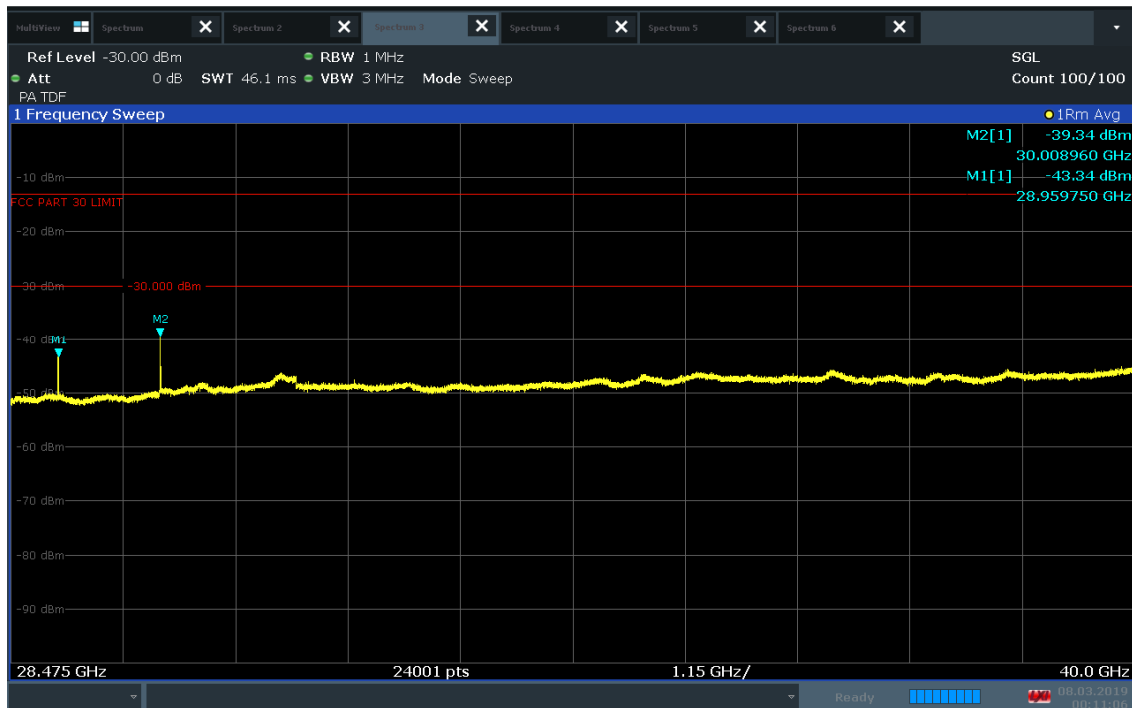
**28.475 – 40GHz**

**ACLRResults**



**Plot 7-161. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK Low Channel H Beam)**

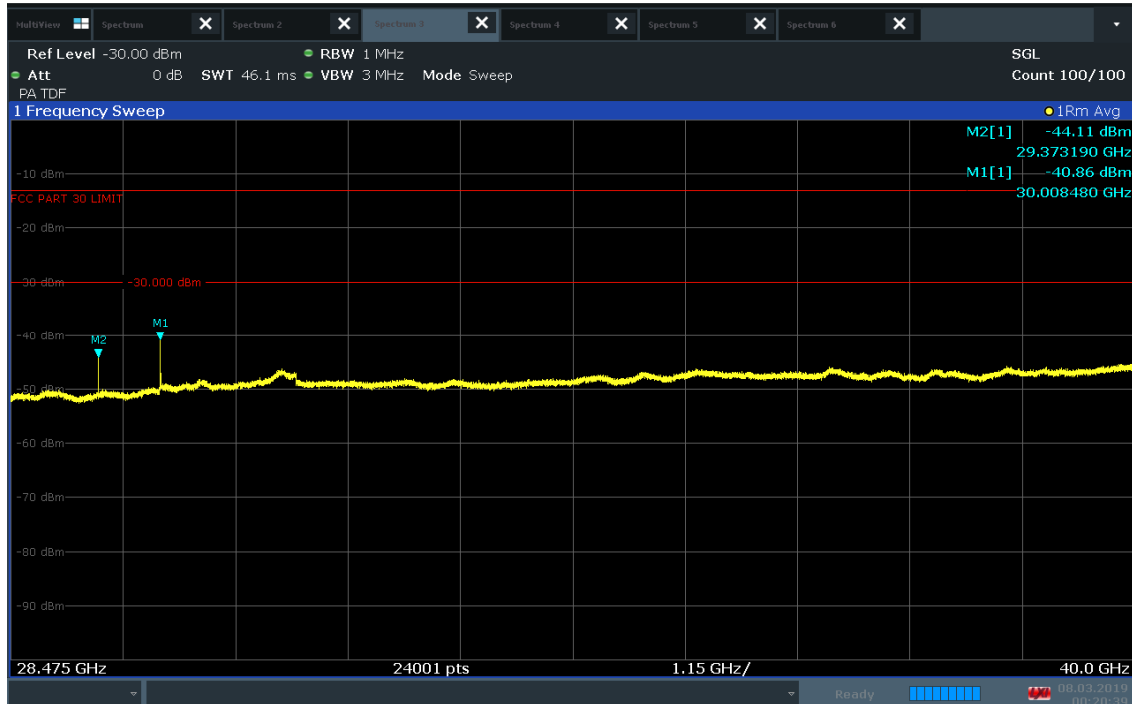
**ACLRResults**



**Plot 7-162. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK Mid Channel H Beam)**

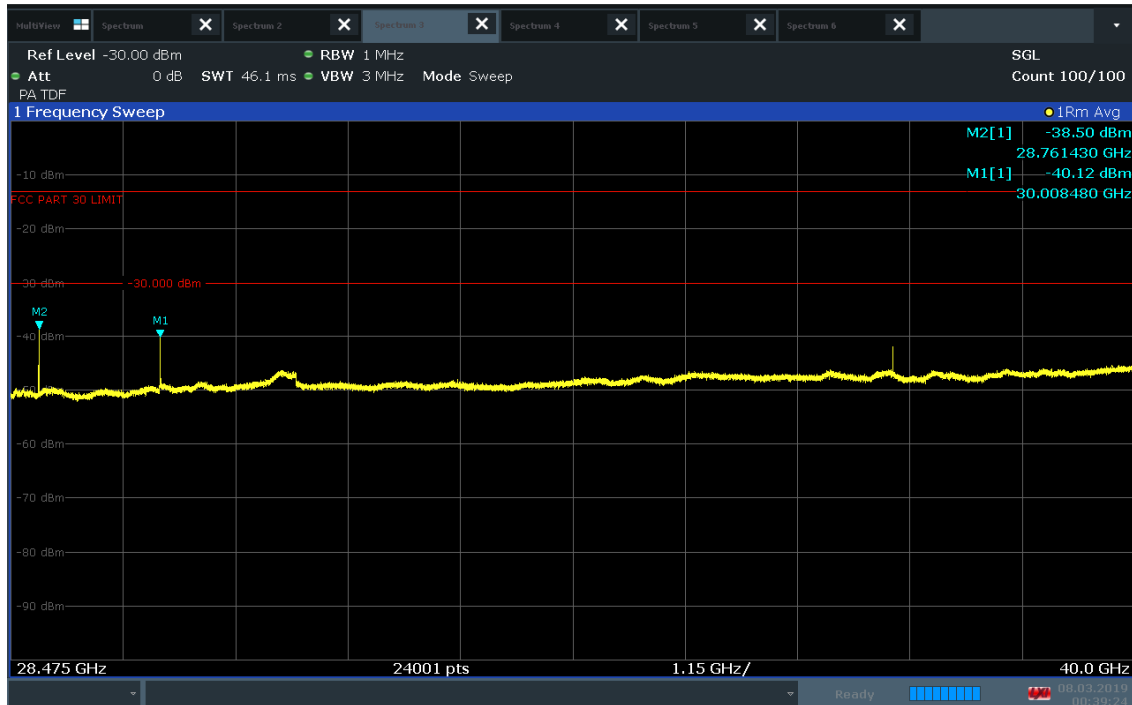
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 122 of 337

ACLRResults



Plot 7-163. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK High Channel H Beam)

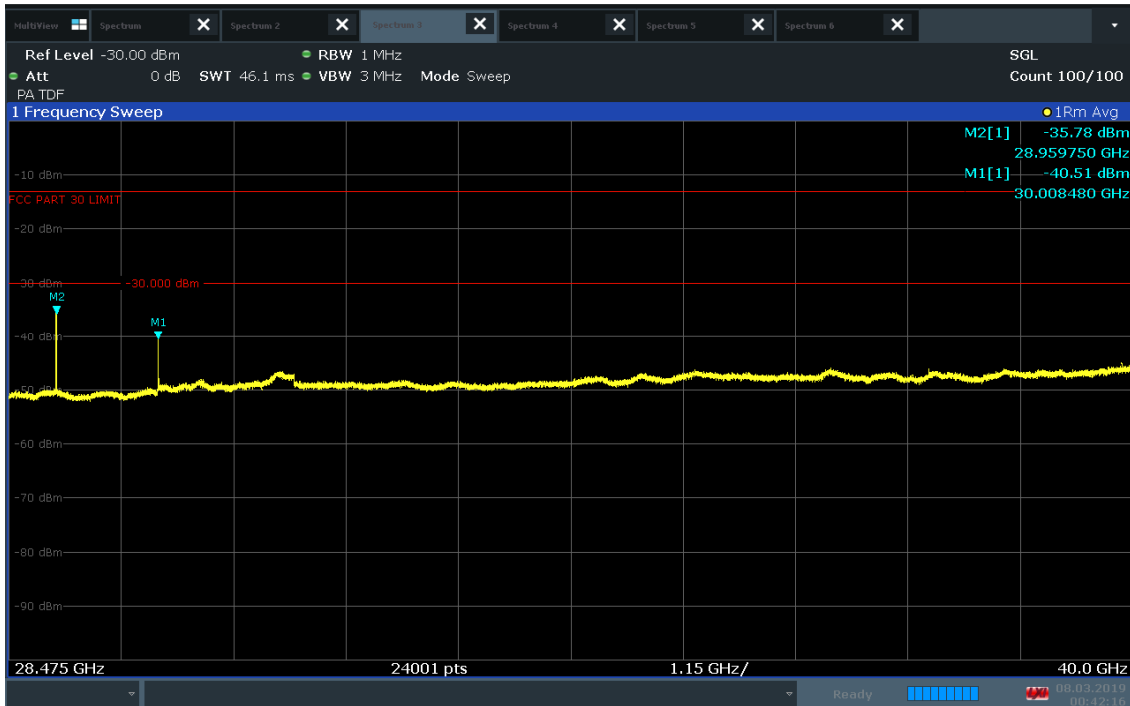
ACLRResults



Plot 7-164. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK Low Channel V Beam)

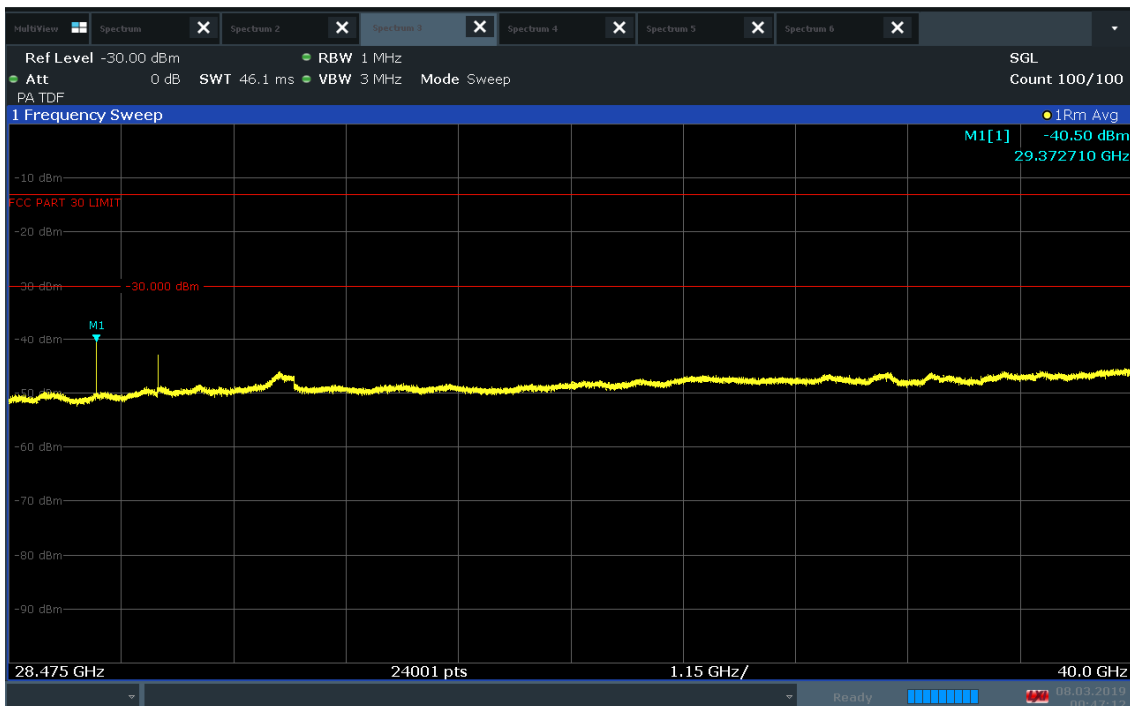
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 123 of 337

ACLRResults



Plot 7-165. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK Mid Channel V Beam)

ACLRResults



Plot 7-166. L Patch Radiated Spurious Plot 28.475-40 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 124 of 337



## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + \text{AFCL [dB/m]} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	EUT Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turntable Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
28761.43	RMS/Avg	Low	50	QPSK	H	V	150	310	-44.36	-13.00	-31.36
28959.75	RMS/Avg	Mid	50	QPSK	H	V	150	34	-43.34	-13.00	-30.34
29373.19	RMS/Avg	High	50	QPSK	H	V	150	127	-44.11	-13.00	-31.11
28761.43	RMS/Avg	Low	50	QPSK	V	V	150	322	-38.50	-13.00	-25.50
28959.75	RMS/Avg	Mid	50	QPSK	V	V	150	304	-35.78	-13.00	-22.78
29372.71	RMS/Avg	High	50	QPSK	V	V	150	346	-40.50	-13.00	-27.50

**Table 7-31. L Patch Spurious Emissions Table (28.475-40 GHz)**

### Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

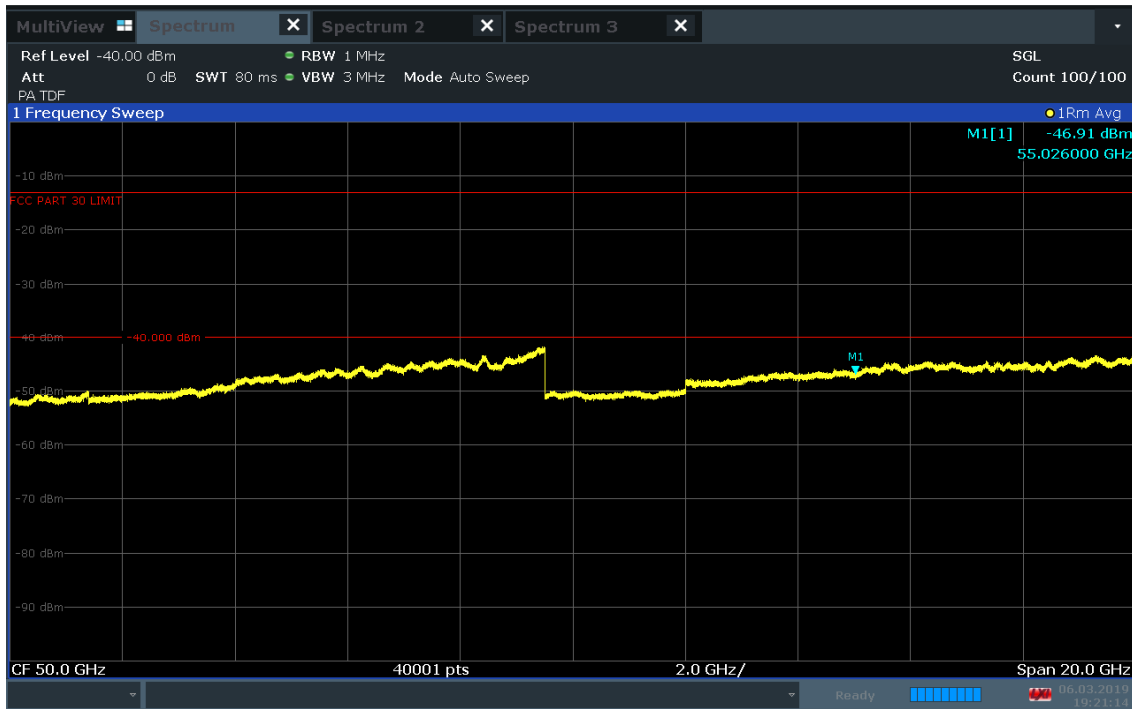
$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-43.34 \text{ dBm} + -35.78 \text{ dBm}) = (46.34 \text{ nW} + 264.24 \text{ nW}) = (310.58 \text{ nW}) = -35.08 \text{ dBm}$$

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset	Page 125 of 337	

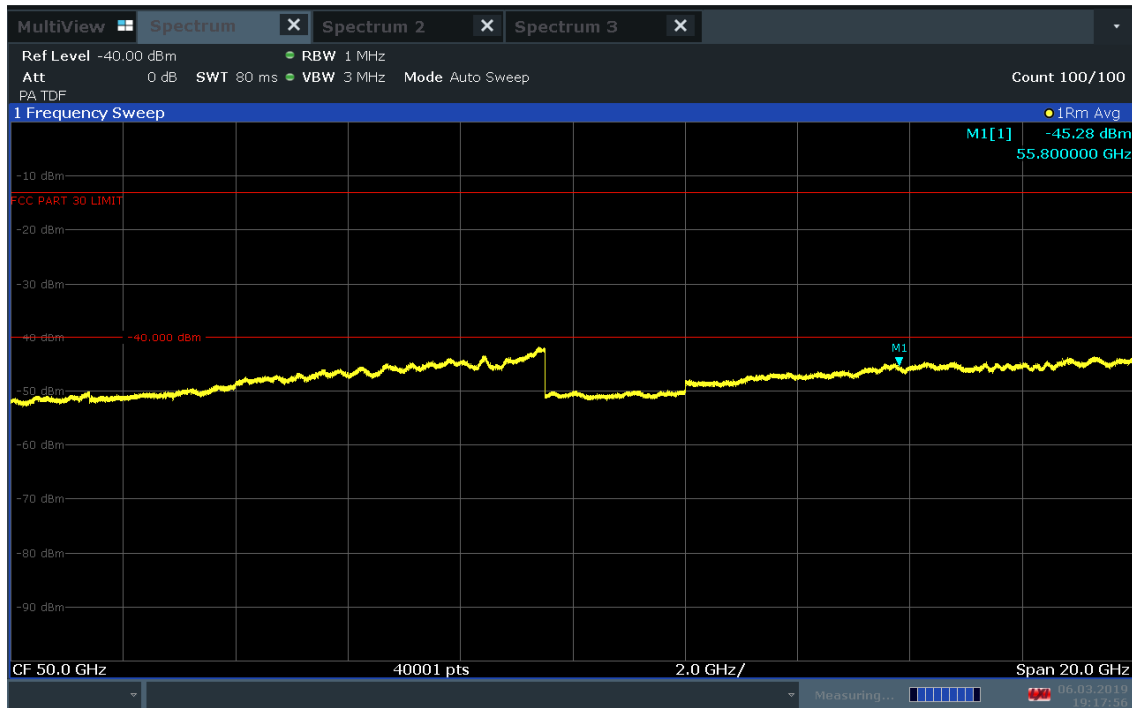
# 40 – 60GHz

ACLRResults



**Plot 7-167. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK Low Channel H Beam)**

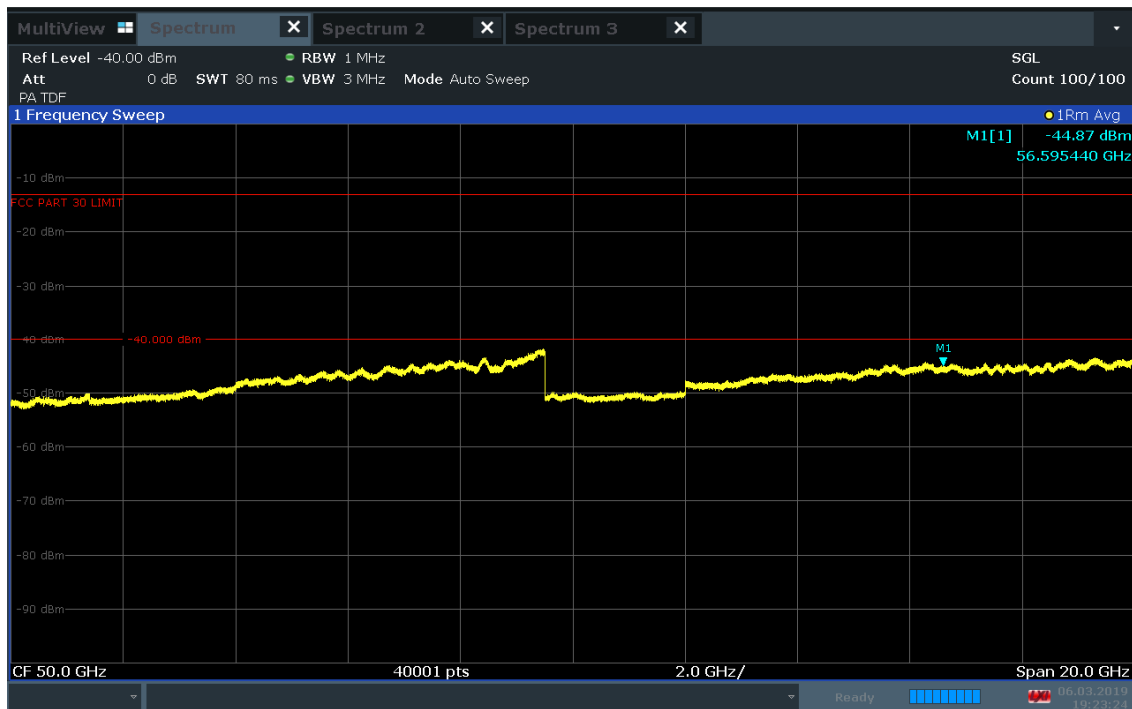
ACLRResults



**Plot 7-168. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK Mid Channel H Beam)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 126 of 337

ACLRResults



Plot 7-169. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK High Channel H Beam)

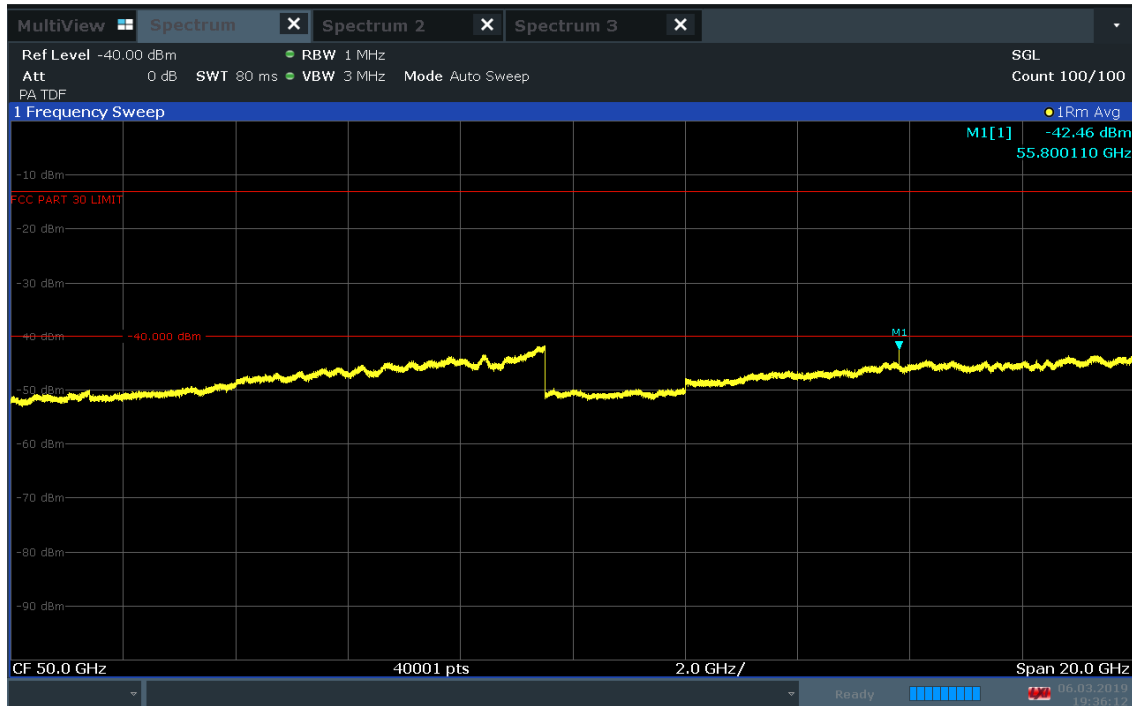
ACLRResults



Plot 7-170. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK Low Channel V Beam)

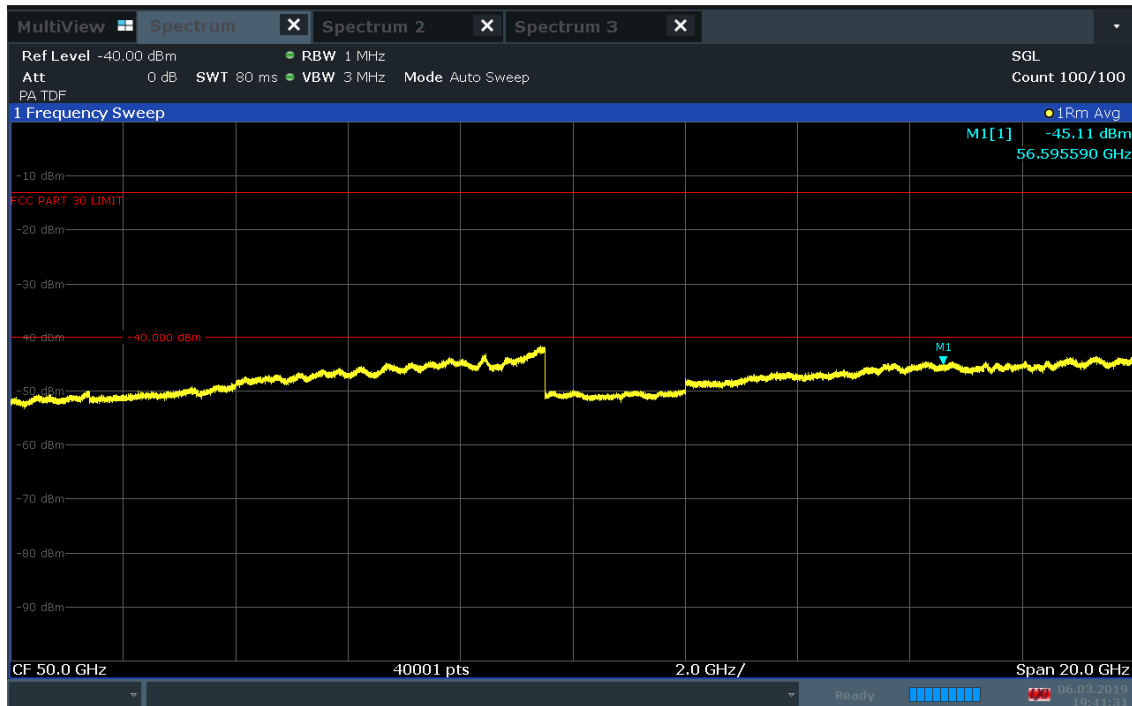
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 127 of 337

ACLRResults



Plot 7-171. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK Mid Channel V Beam)

ACLRResults



Plot 7-172. L Patch Radiated Spurious Plot 40-60 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 128 of 337

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## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	EUT Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
55026.00	RMS/Avg	Low	50	QPSK	H	V	150	321	-46.91	-13.00	-33.91
55800.00	RMS/Avg	Mid	50	QPSK	H	V	150	41	-45.28	-13.00	-32.28
56595.44	RMS/Avg	High	50	QPSK	H	V	150	122	-44.87	-13.00	-31.87
55026.50	RMS/Avg	Low	50	QPSK	V	V	150	310	-44.36	-13.00	-31.36
55800.11	RMS/Avg	Mid	50	QPSK	V	V	150	292	-42.46	-13.00	-29.46
56595.59	RMS/Avg	High	50	QPSK	V	V	150	359	-45.11	-13.00	-32.11

**Table 7-32. L Patch Spurious Emissions Table (40 - 60GHz)**

### Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-45.28 \text{ dBm} + -42.46 \text{ dBm}) = (29.64 \text{ nW} + 56.75 \text{ nW}) = (86.40 \text{ nW}) = -40.63 \text{ dBm}$$

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Plot 7-173. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Low Channel H Beam)



Plot 7-174. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Mid Channel H Beam)

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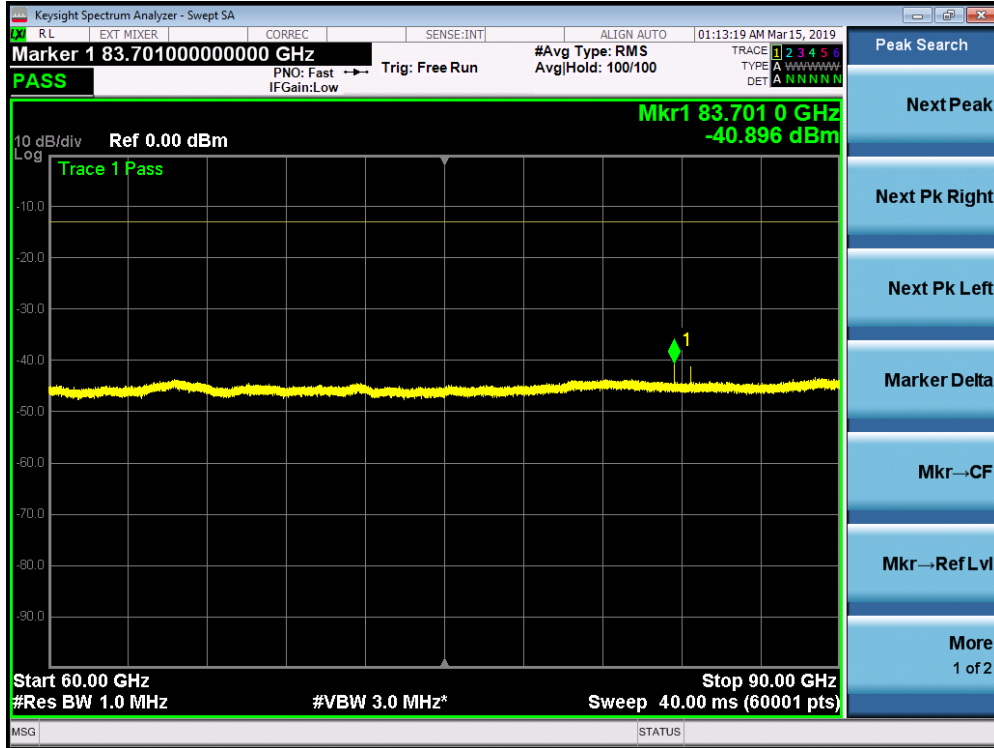


Plot 7-175. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK High Channel H Beam)



Plot 7-176. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Low Channel V Beam)

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Plot 7-177. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK Mid Channel V Beam)



Plot 7-178. L Patch Radiated Spurious Plot 60-90 GHz (1CC QPSK High Channel V Beam)

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## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBμV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} + \text{Harmonic Mixer Loss (dB)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	EUT Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
83184.00	RMS/Avg	Low	50	QPSK	H	V	150	326	-42.74	-13.00	-29.74
83701.00	RMS/Avg	Mid	50	QPSK	H	V	150	28	-43.15	-13.00	-30.15
84893.00	RMS/Avg	High	50	QPSK	H	V	150	99	-43.36	-13.00	-30.36
83184.00	RMS/Avg	Low	50	QPSK	V	V	150	343	-39.98	-13.00	-26.98
83701.00	RMS/Avg	Mid	50	QPSK	V	V	150	288	-40.90	-13.00	-27.90
84893.00	RMS/Avg	High	50	QPSK	V	V	150	335	-40.95	-13.00	-27.95

**Table 7-33. L Patch Spurious Emissions Table (60-90GHz)**

### Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

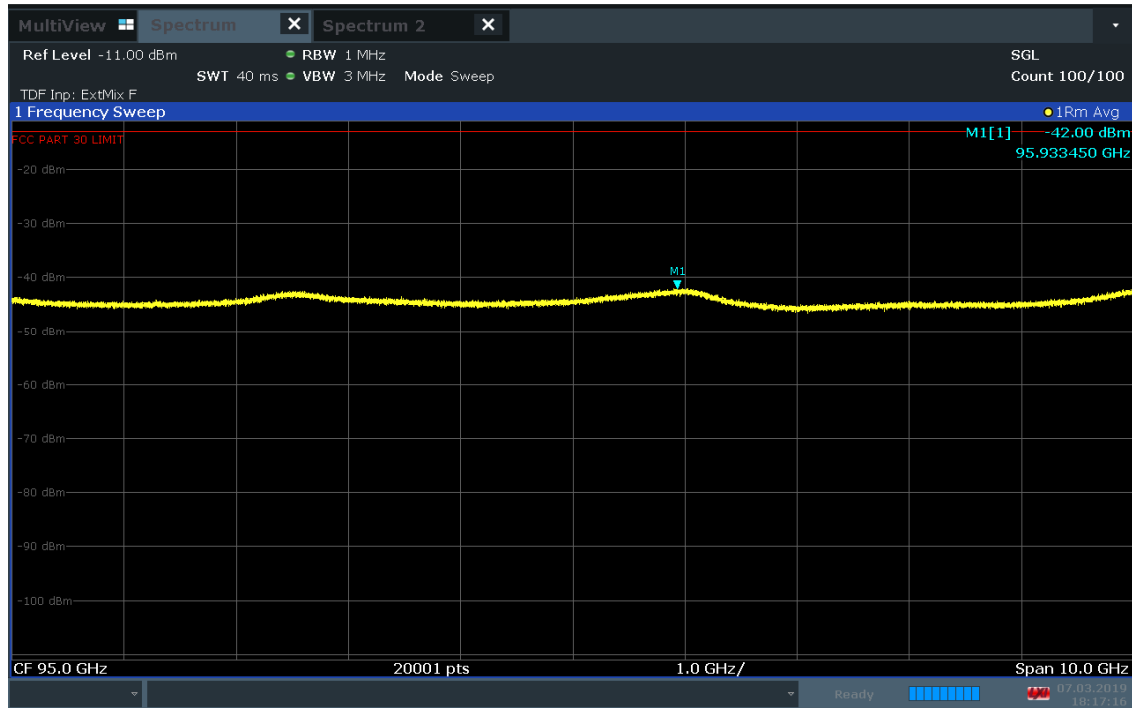
$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-42.74 \text{ dBm} + -39.98 \text{ dBm}) = (53.21 \text{ nW} + 100.46 \text{ nW}) = (153.67 \text{ nW}) = -38.13 \text{ dBm}$$

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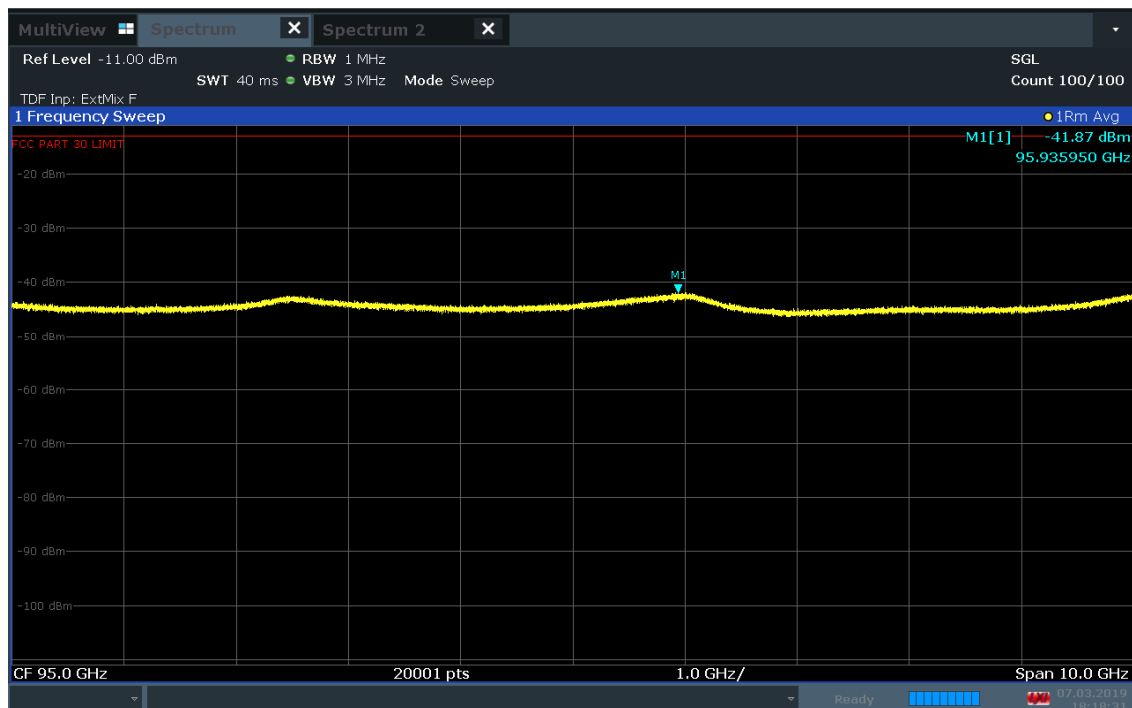
# 90 – 100GHz

## ACLRResults



**Plot 7-179. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Low Channel H Beam)**

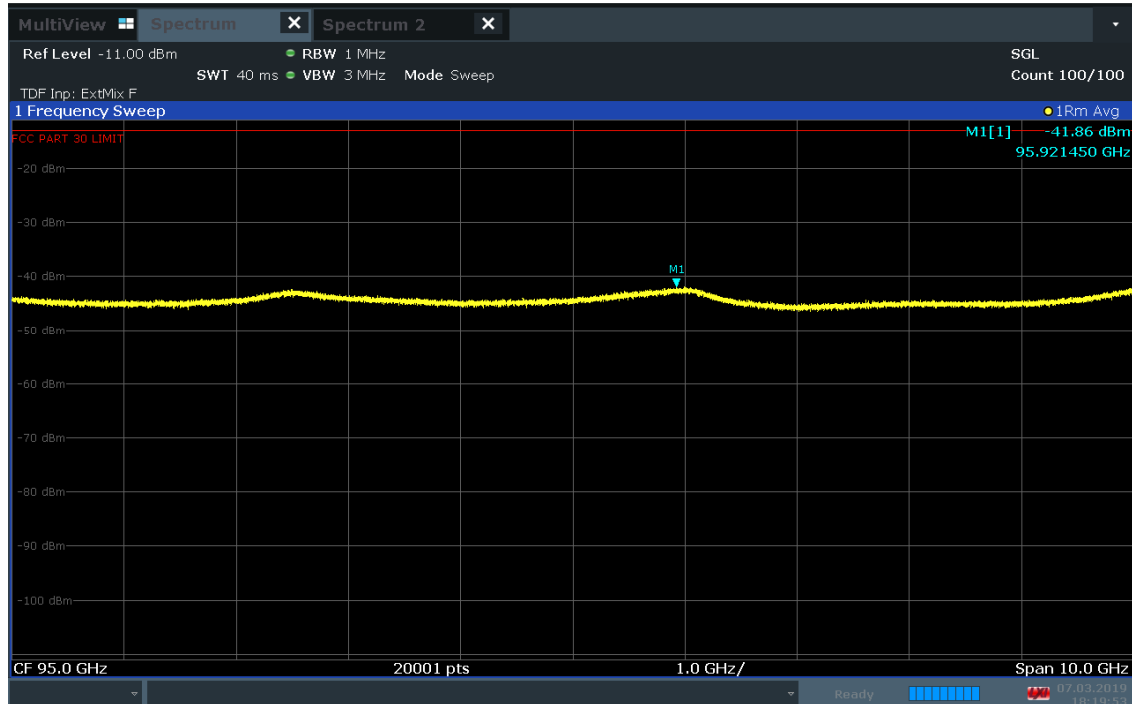
## ACLRResults



**Plot 7-180. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Mid Channel H Beam)**

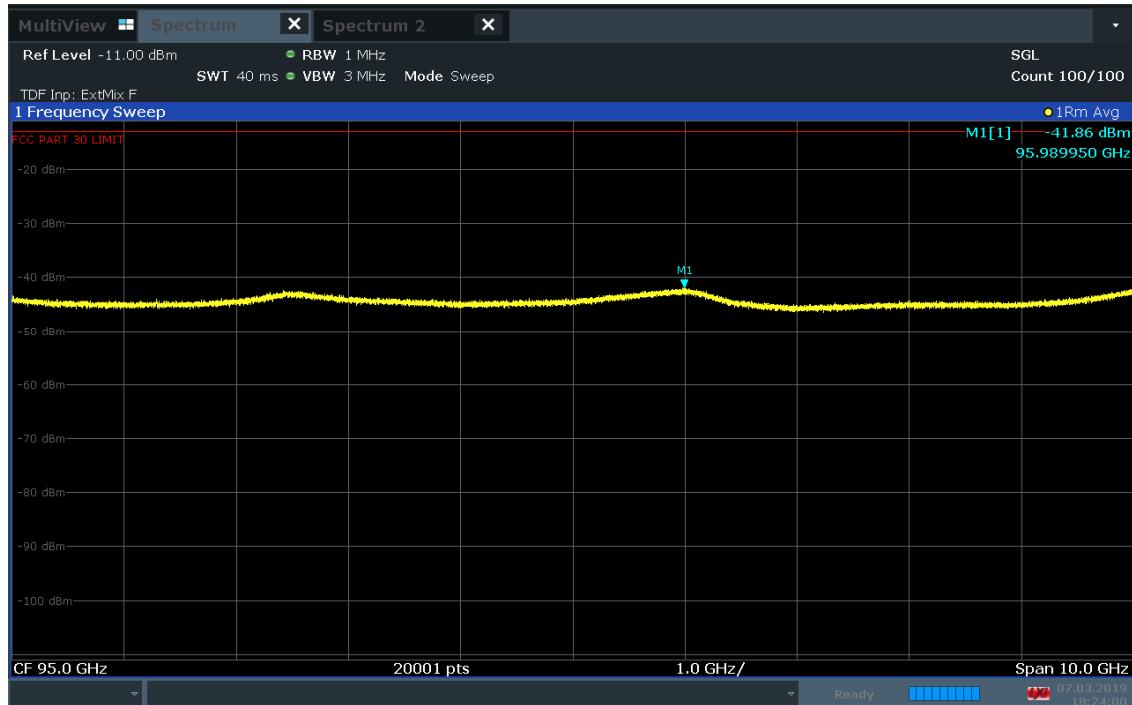
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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ACLRRResults



Plot 7-181. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK High Channel H Beam)

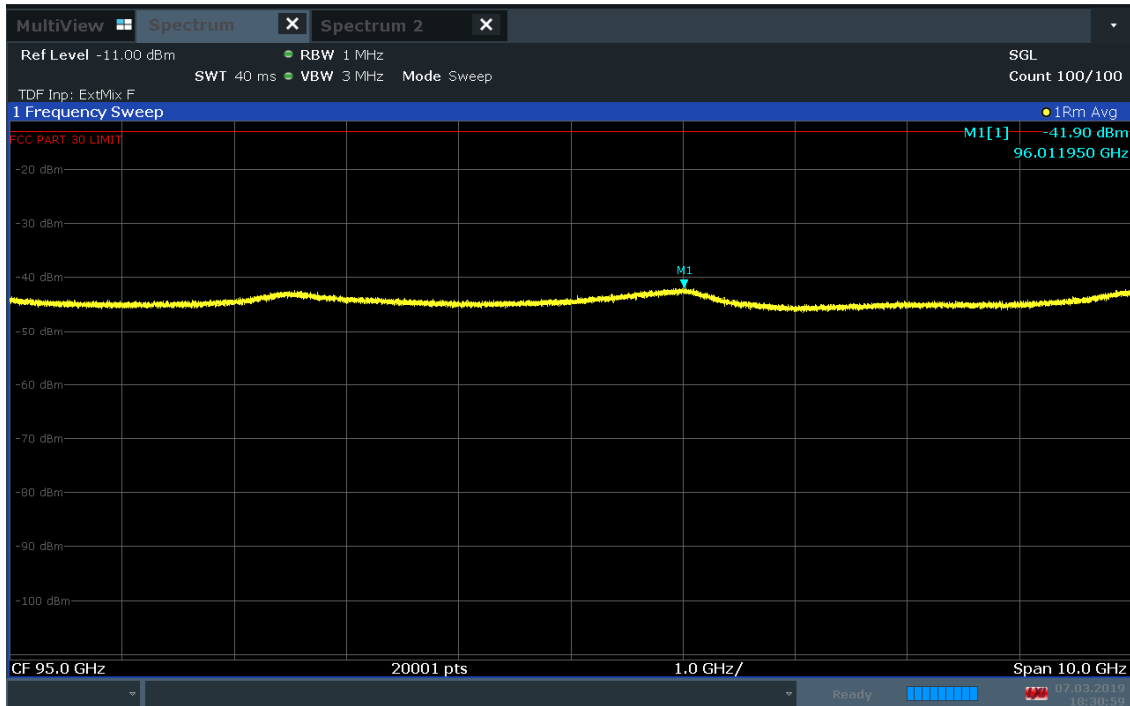
ACLRRResults



Plot 7-182. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Low Channel V Beam)

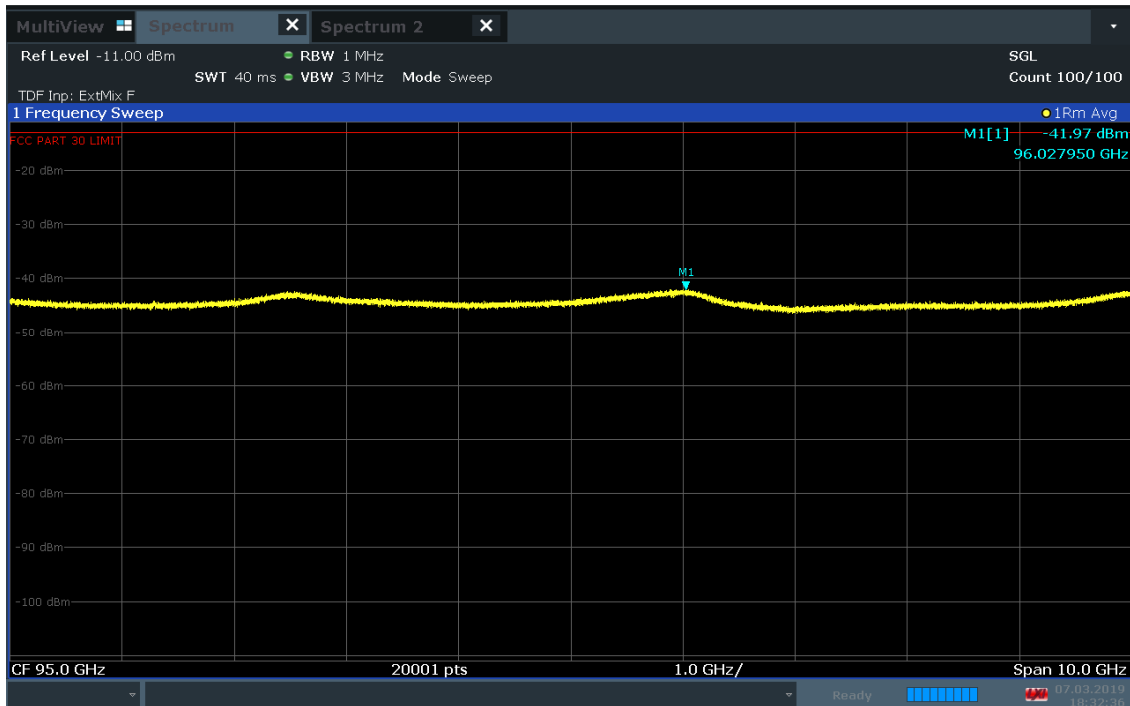
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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ACLRResults



Plot 7-183. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK Mid Channel V Beam)

ACLRResults



Plot 7-184. L Patch Radiated Spurious Plot 90-100 GHz (1CC QPSK High Channel V Beam)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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## Spurious Emissions EIRP Sample Calculation

The raw radiated spurious level is converted to field strength in dBµV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP [dBm]} = \text{Analyzer Level [dBm]} + 107 + \text{AFCL [dB/m]} + 20\text{Log(Dm)} + \text{Harmonic Mixer Loss (dB)} - 104.8$$

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
95933.45	RMS/Avg	Low	50	QPSK	H	H	-	-	-42.00	-13.00	-29.00
95935.95	RMS/Avg	Mid	50	QPSK	H	H	-	-	-41.87	-13.00	-28.87
95921.45	RMS/Avg	High	50	QPSK	H	H	-	-	-41.86	-13.00	-28.86
95989.95	RMS/Avg	Low	50	QPSK	V	V	-	-	-41.86	-13.00	-28.86
96011.95	RMS/Avg	Mid	50	QPSK	V	V	-	-	-41.90	-13.00	-28.90
96027.95	RMS/Avg	High	50	QPSK	V	V	-	-	-41.97	-13.00	-28.97

**Table 7-34. L Patch Spurious Emissions Table (90-100GHz)**

### Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

$$\text{EIRP(H Beam)} + \text{EIRP(V Beam)} = \text{EIRP(MIMO)}$$

$$(-41.87 \text{ dBm} + -41.90 \text{ dBm}) = (65.01 \text{ nW} + 64.57 \text{ nW}) = (129.58 \text{ nW}) = -38.87 \text{ dBm}$$

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## 7.5 Band Edge Emissions

§2.1051, §30.203

### Test Overview

All out of band emissions are measured in a radiated setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

***The minimum permissible attenuation level of any spurious emission is -13dbm/1MHz. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.***

### Test Procedure Used

ANSI C63.26-2015 Section 5 and ANSI C63.26-2015 Section 6.4

### Test Settings

1. Start and stop frequency were set such that both upper and lower band edges are measured.
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times$  Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning.
- 2) Band Edge measurements in this section are shown as equivalent conductive powers for direct comparison to the 30.203 limit. The conductive power at the band edge is calculated by subtracting the gain of the EUT's antenna from the measured EIRP level. Antenna Gain information is shown on the following page.
- 3) Band Edge emissions were measured at a 1 meter distance.
- 4) The spectrum analyzer for each measurement shows an offset value that was determined using the measurement antenna factor, cable loss, far field measurement distance, and EUT antenna gain. A sample calculation is shown on the following page.
- 5) MIMO Band Edge plots shown below are mathematically summed conductive powers between spectrum analyzer measurements on H Beam and V Beam. This MIMO bandedge plot was produced by summing the following two spectrum analyzer traces: (1) the first trace is maximized while the EUT is transmitting in H-beam and (2) the second trace is maximized while the EUT is transmitting in V-beam.
- 6) The MIMO Band Edges were calculated by using the "measure and sum the spectra across the outputs" technique specified in Section 6.4.3.2.2 of ANSI C63.26-2015. The spectra were summed linearly and converted to dBm for comparison with the limit.

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### 7.5.1 Antenna Gain Information at the Band Edge

The following antenna gain information is provided to demonstrate the antenna performance of the 27.5 – 28.35GHz band. These antenna gains were subtracted from the measured EIRP levels at the lower and upper band edge frequencies to determine an equivalent conductive power that was compared directly with the §30.203 limits.

Antenna	Channel	Beam Polarization	Beam ID	Gain (dBi)
J Dipole	Low	H	5	7.53
		V	133	7.77
	High	H	16	7.41
		V	144	7.50
J Patch	Low	H	25	11.16
		V	153	10.08
	High	H	40	10.43
		V	153	10.56
K Patch	Low	H	31	9.13
		V	157	8.22
	High	H	45	10.27
		V	173	7.27
L Patch	Low	H	48	9.00
		V	164	7.47
	High	H	48	10.31
		V	177	8.54

**Table 7-35. Antenna Gains at the Band Edges**

#### Sample Analyzer Offset Calculation (at 27.5GHz)

Measurement Antenna Factor = 40.70dB/m

Cable Loss = 8.44dB

EUT Antenna Gain = 7.53dBi

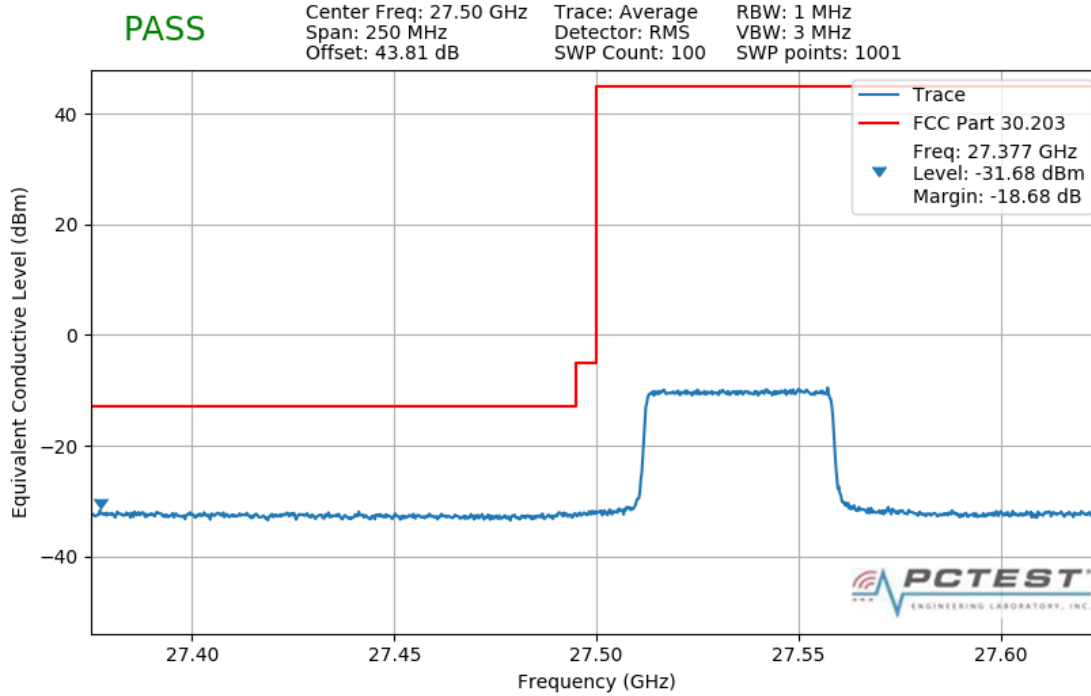
Analyzer Offset (dB) = AF (dB/m) + CL (dB) + 107 + 20log<sub>10</sub>(D) – 104.8dB – Gain (dBi), where D = 1m

$$= 40.70\text{dB/m} + 8.44\text{dB} + 107 + 20\log_{10}(1\text{m}) - 104.8\text{dB} - 7.53\text{dBi}$$

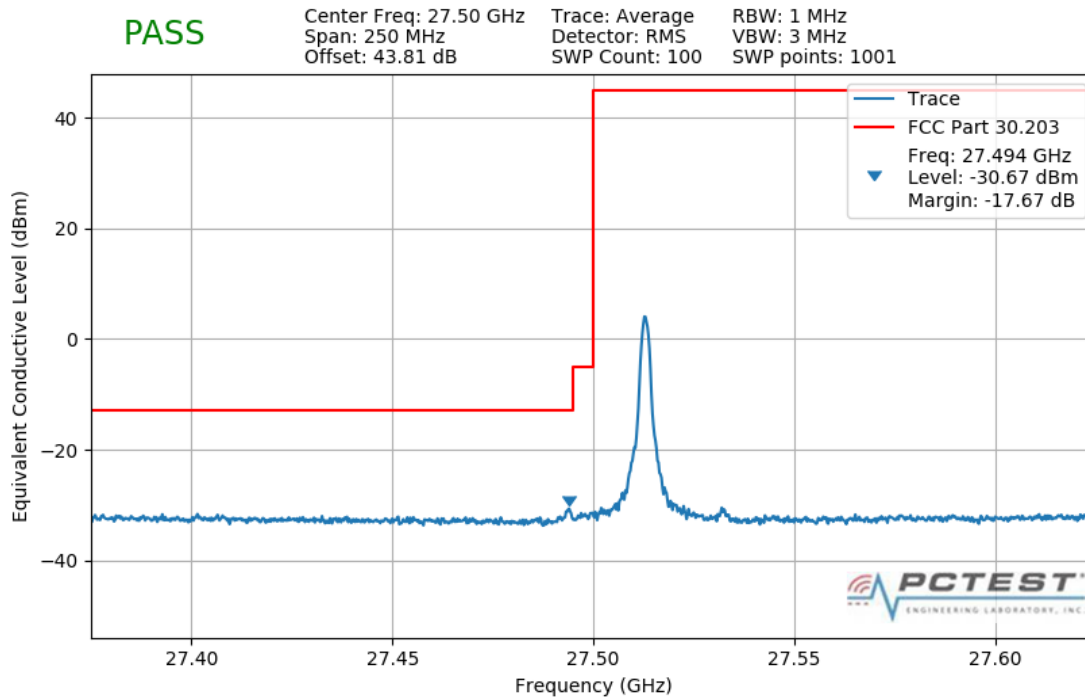
$$= 43.81\text{dB}$$

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### 7.5.2 J Dipole Band Edge H Beam



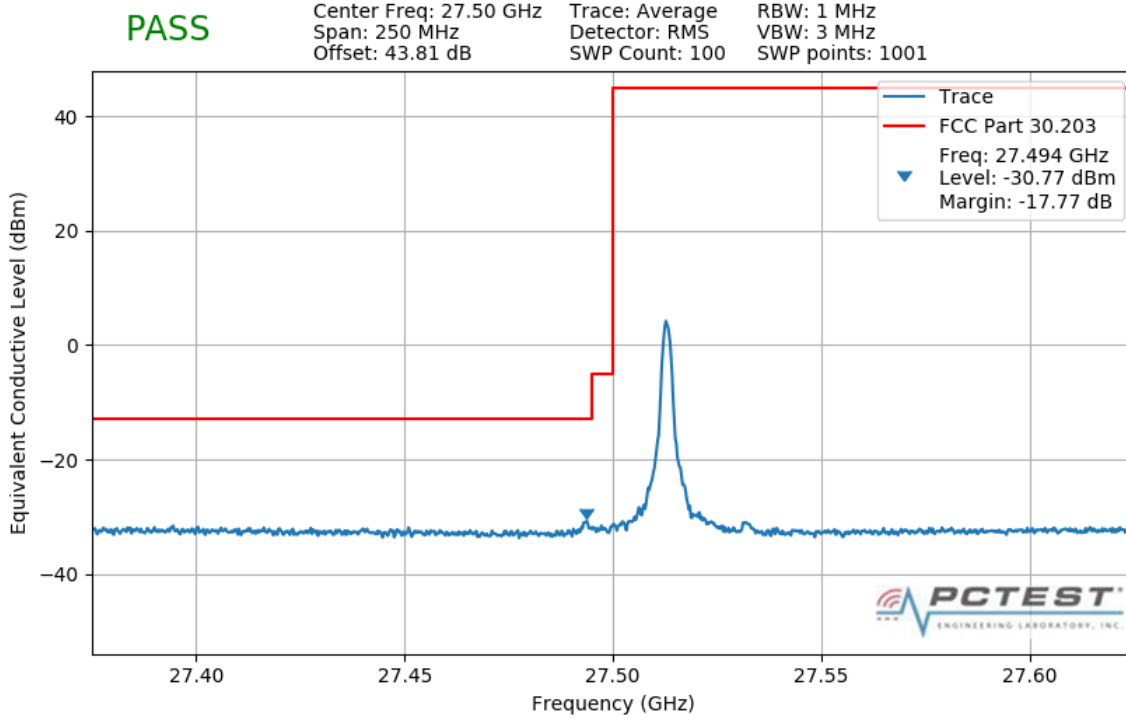
**Plot 7-185. Lower Band Edge Plot (1CC 50MHz QPSK Full RB)**



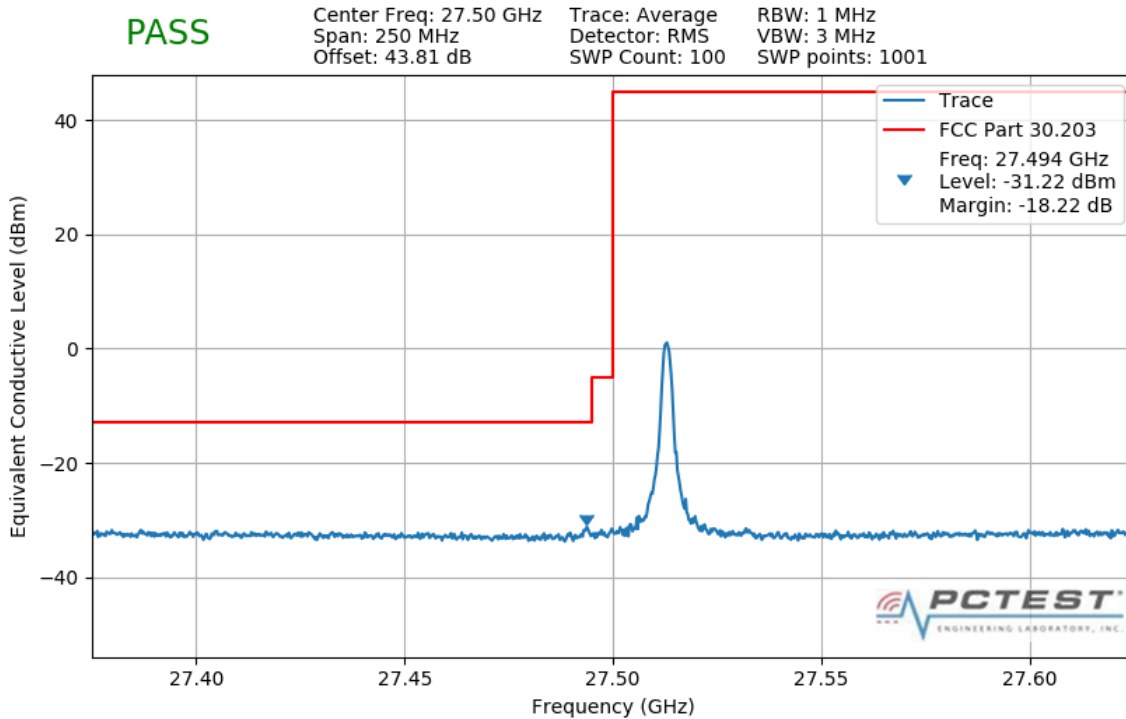
**Plot 7-186. Lower Band Edge Plot (1CC 50MHz QPSK 1 RB)**

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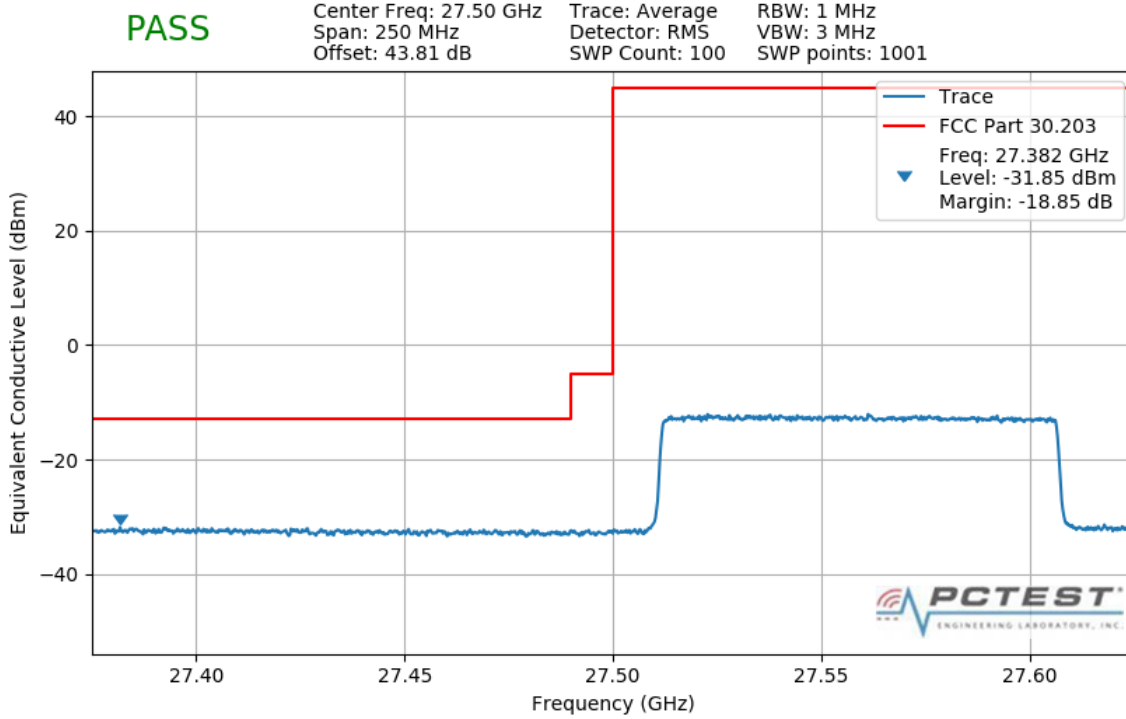


**Plot 7-187. Lower Band Edge Plot (1CC 50MHz 16QAM 1 RB)**

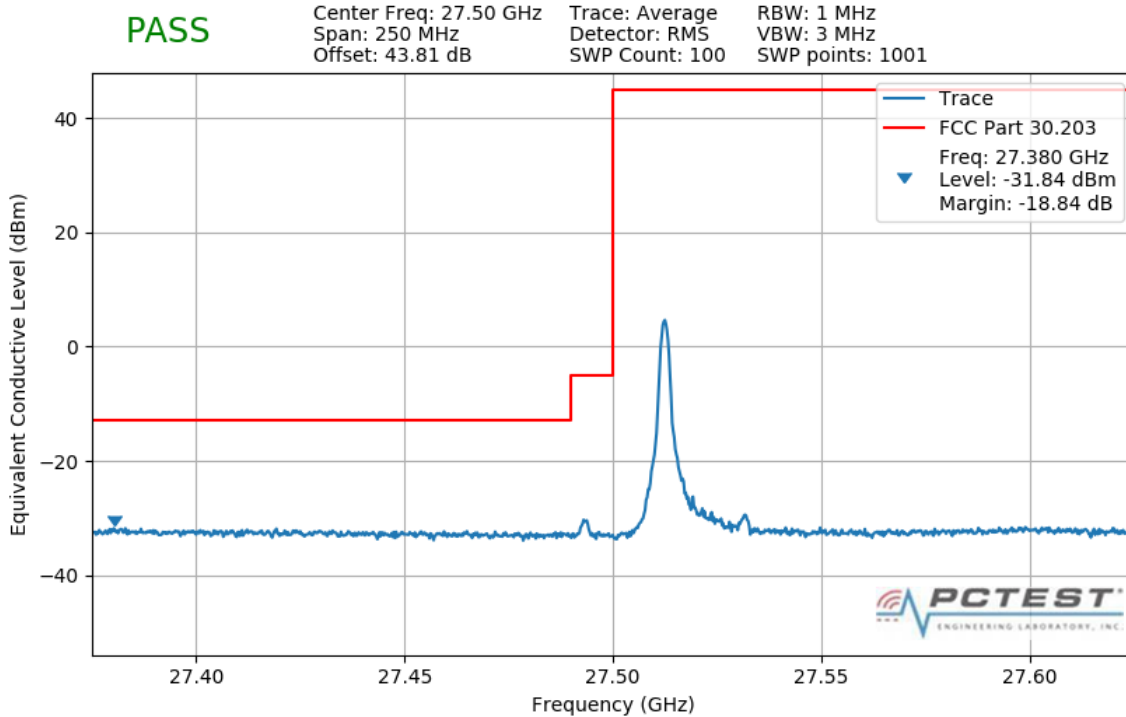


**Plot 7-188. Lower Band Edge Plot (1CC 50MHz 64QAM 1 RB)**

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Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 141 of 337

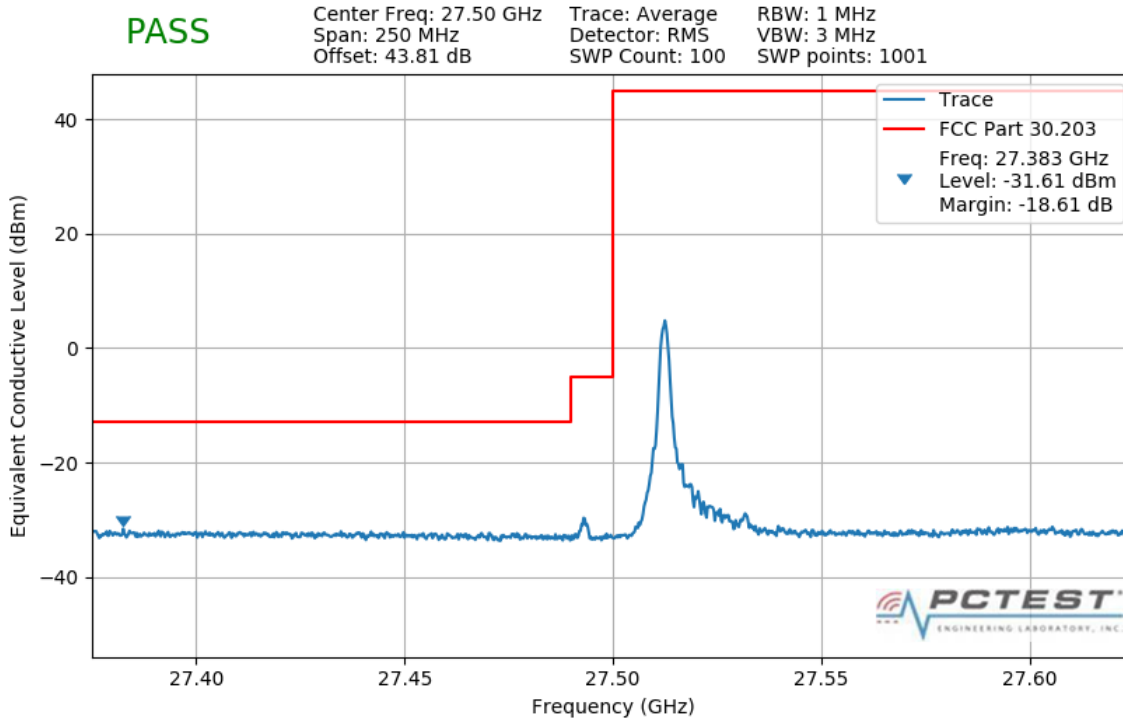


**Plot 7-189. Lower Band Edge Plot (1CC 100MHz QPSK Full RB)**

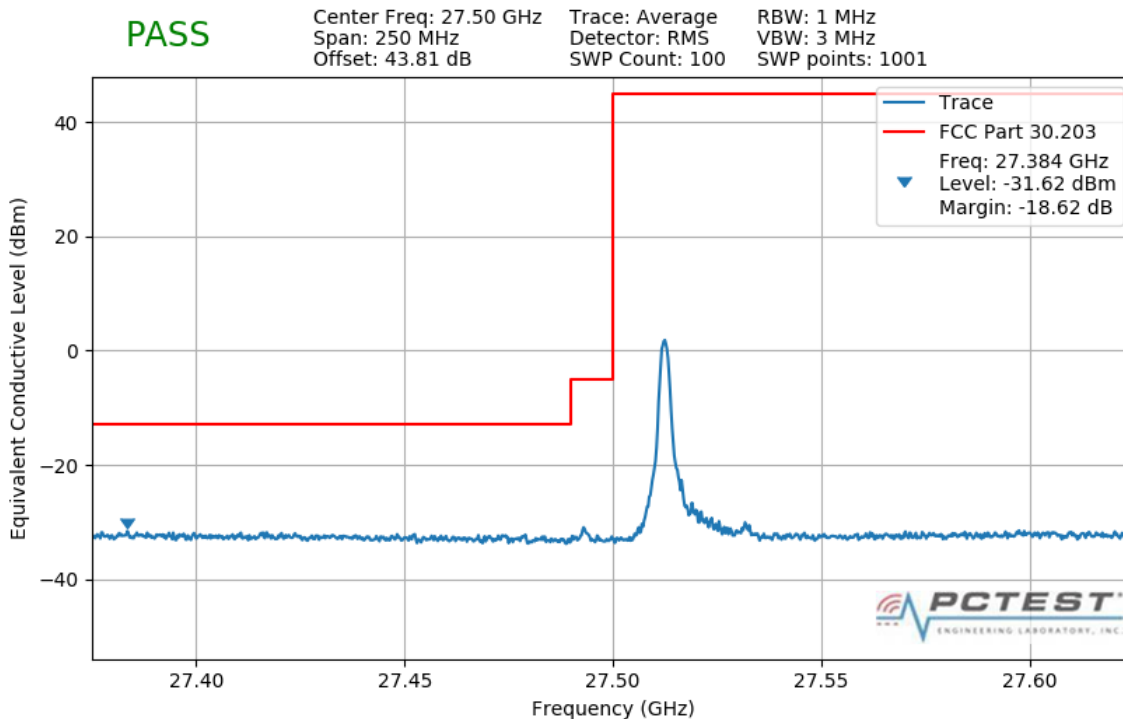


**Plot 7-190. Lower Band Edge Plot (1CC 100MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
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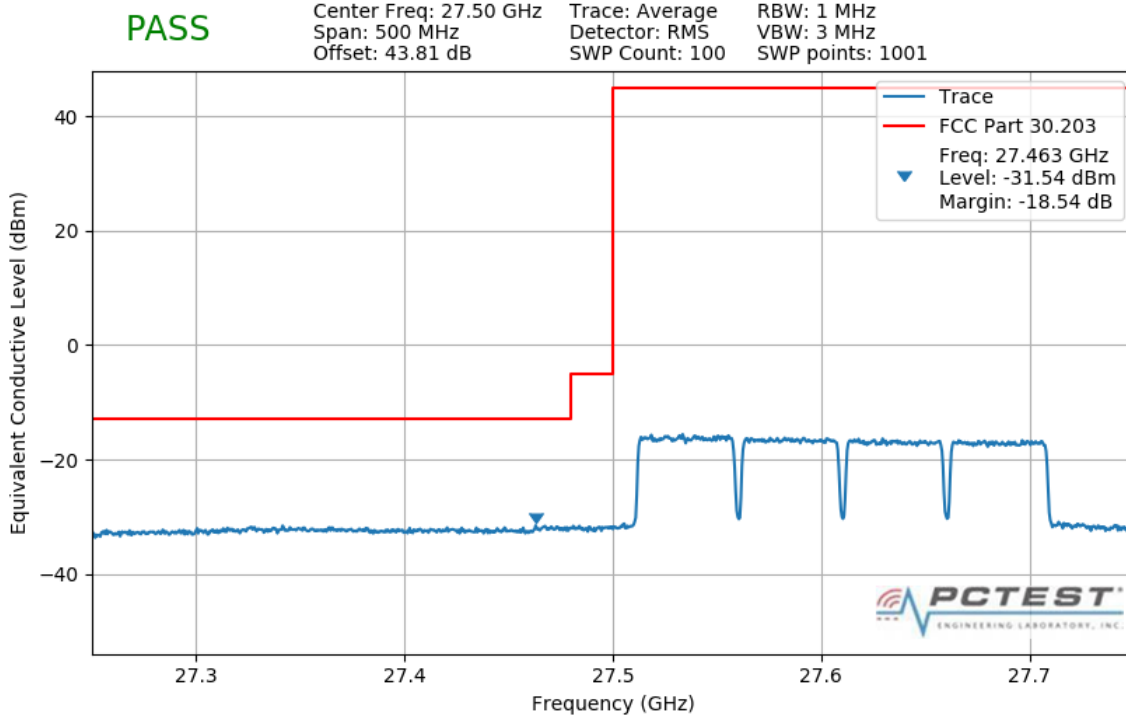


**Plot 7-191. Lower Band Edge Plot (1CC 100MHz 16QAM 1 RB)**

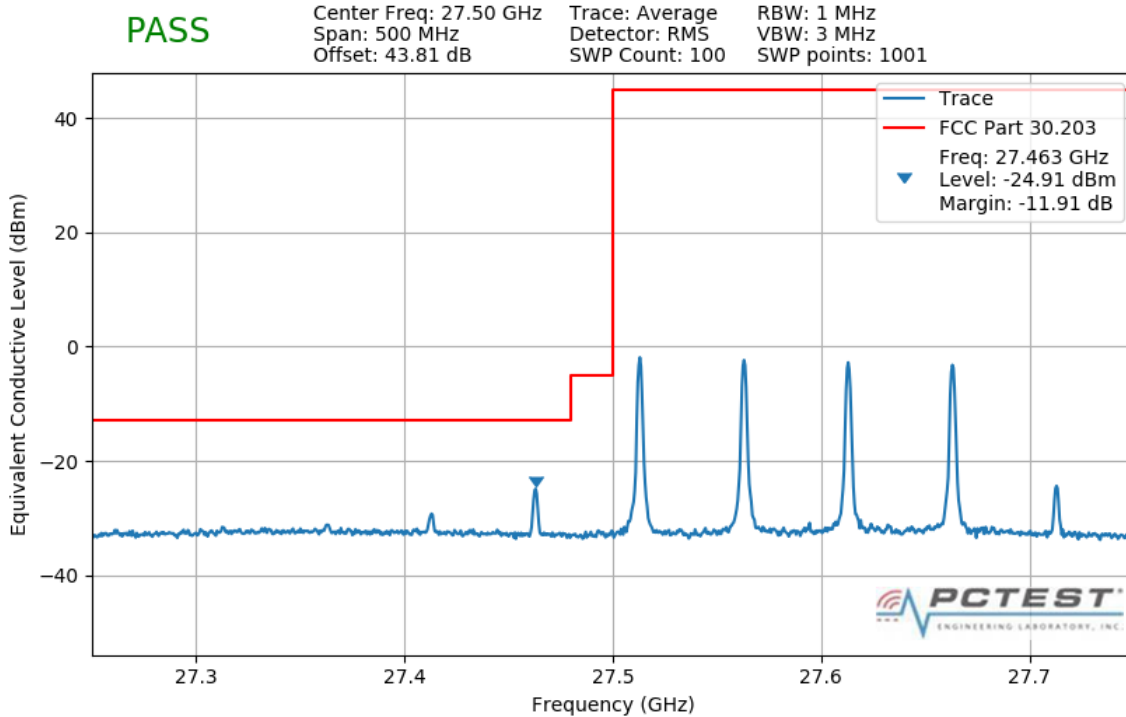


**Plot 7-192. Lower Band Edge Plot (1CC 100MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 143 of 337

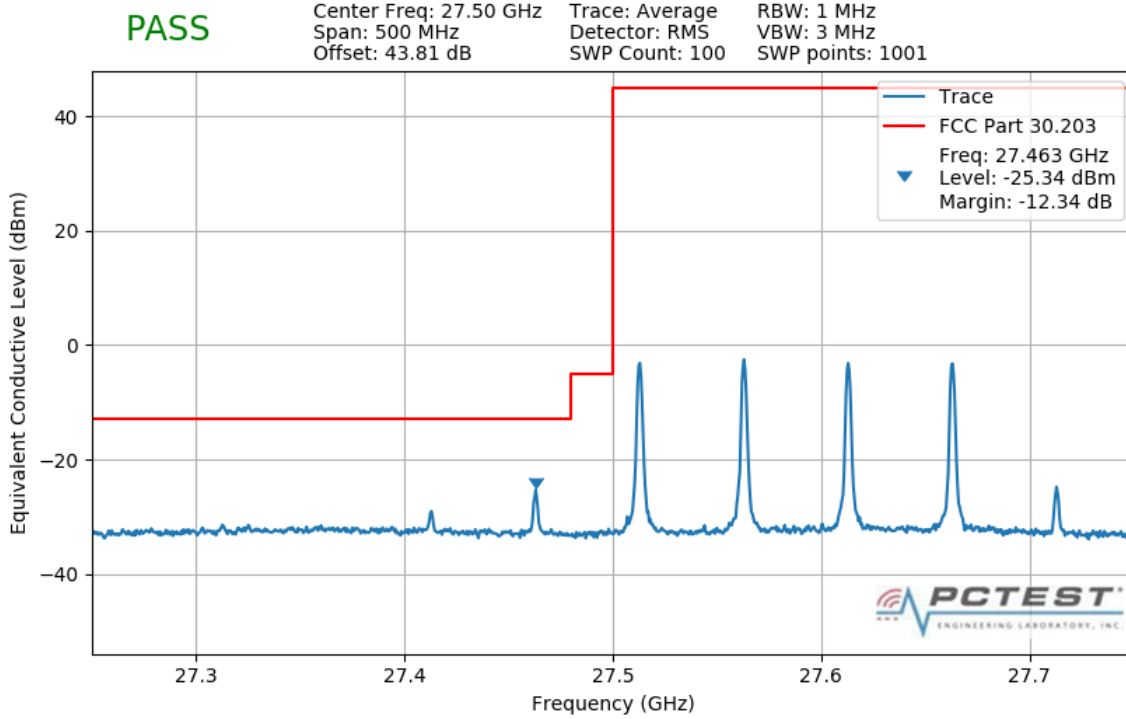


**Plot 7-193. Lower Band Edge Plot (4CC 200MHz QPSK Full RB)**

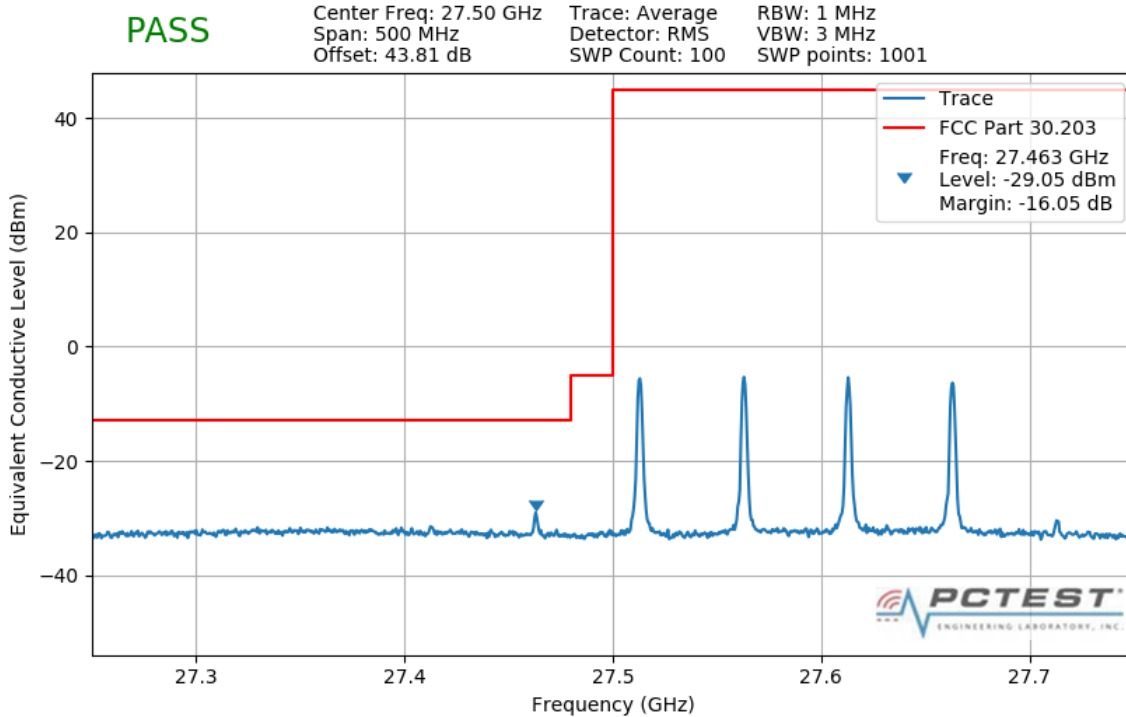


**Plot 7-194. Lower Band Edge Plot (4CC 200MHz QPSK 1 RB)**

FCC ID: A3LSMG977U	<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
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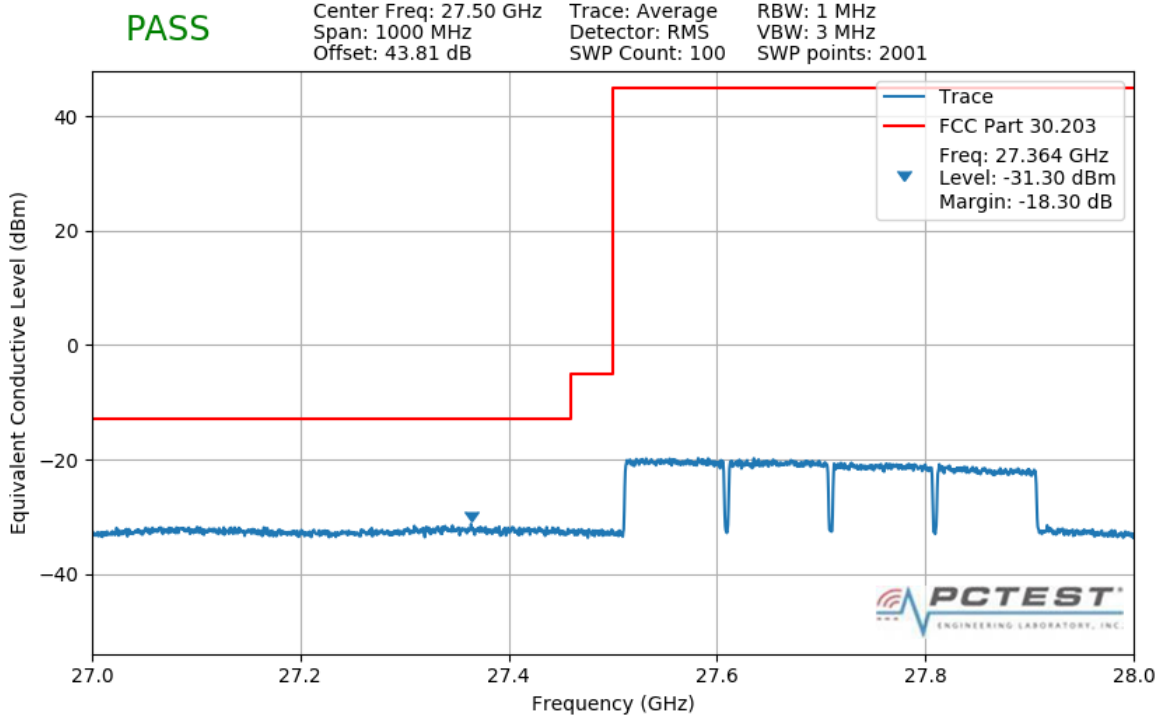


**Plot 7-195. Lower Band Edge Plot (4CC 200MHz 16QAM 1 RB)**

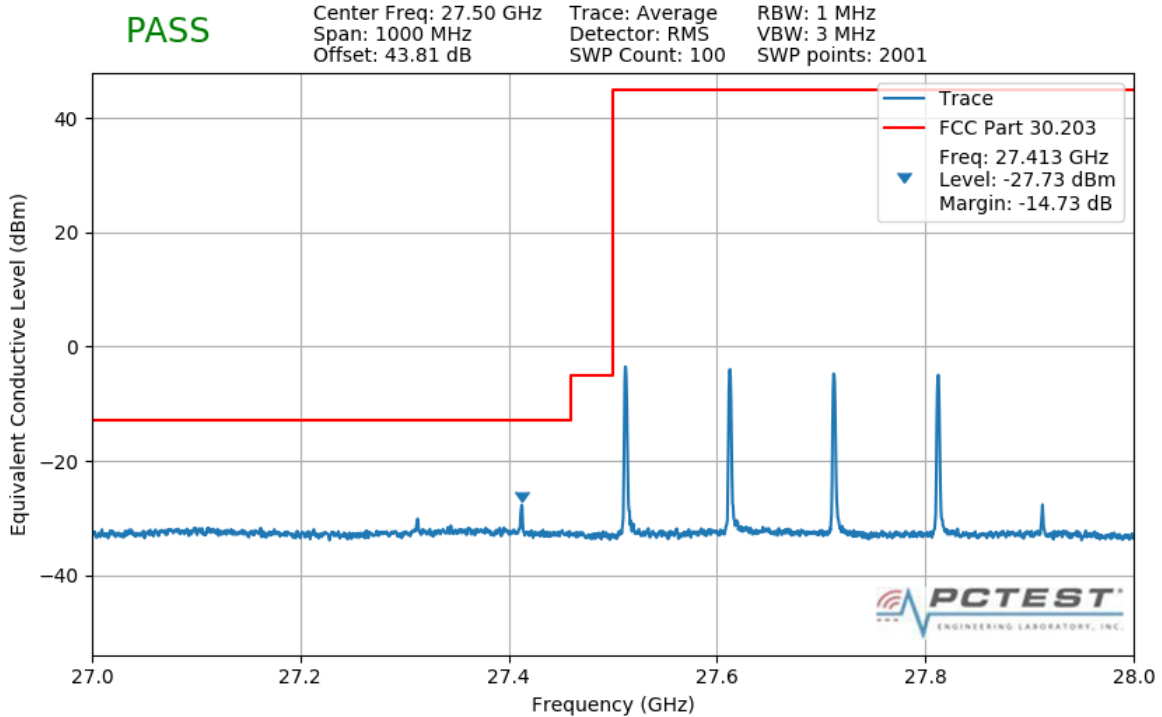


**Plot 7-196. Lower Band Edge Plot (4CC 200MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT</b> (CERTIFICATION)	<b>SAMSUNG</b>	Approved by: Quality Manager
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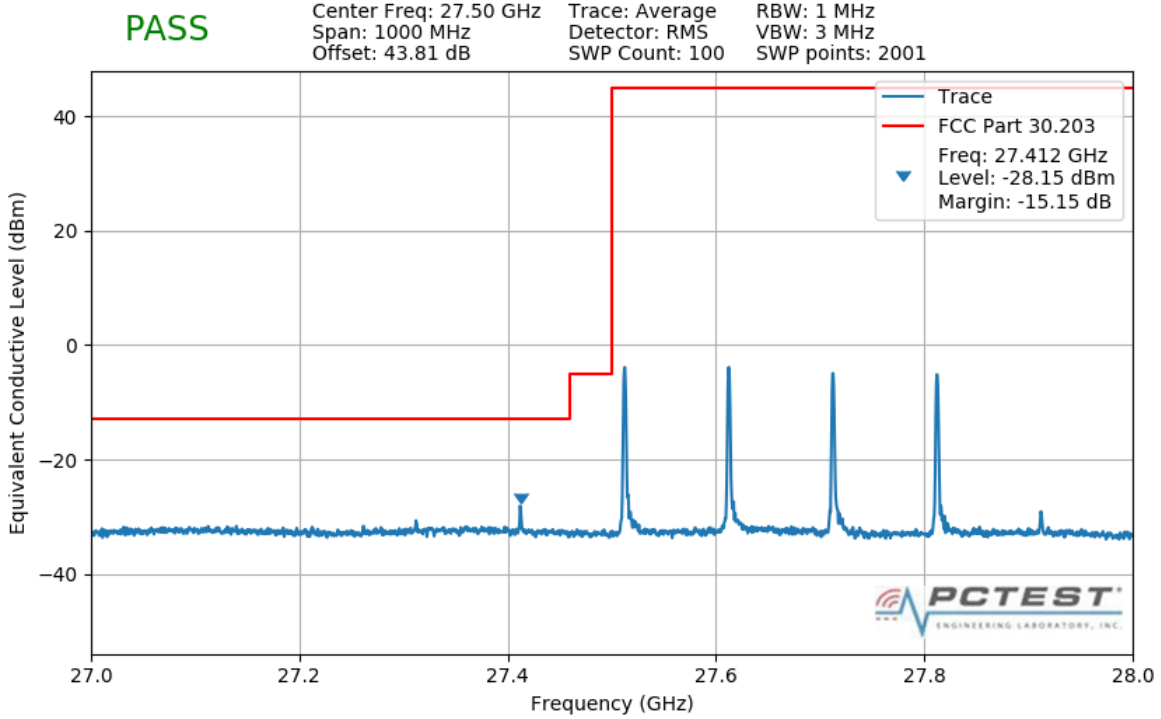


**Plot 7-197. Lower Band Edge Plot (4CC 400MHz QPSK Full RB)**

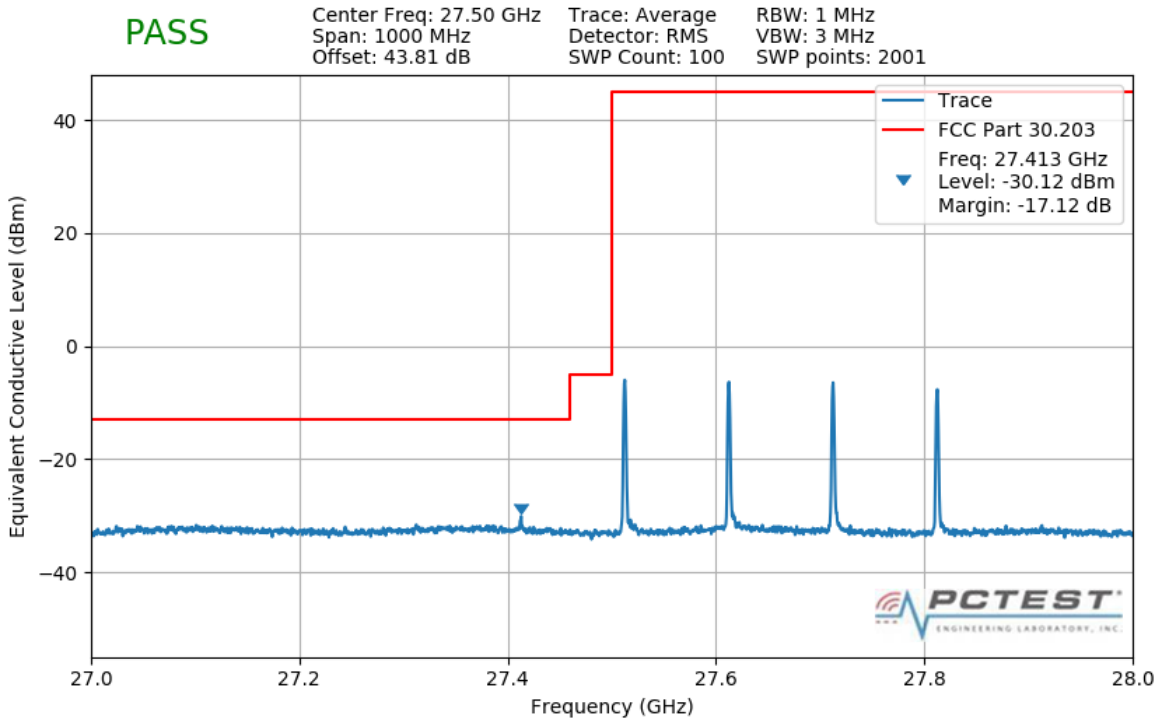


**Plot 7-198. Lower Band Edge Plot (4CC 400MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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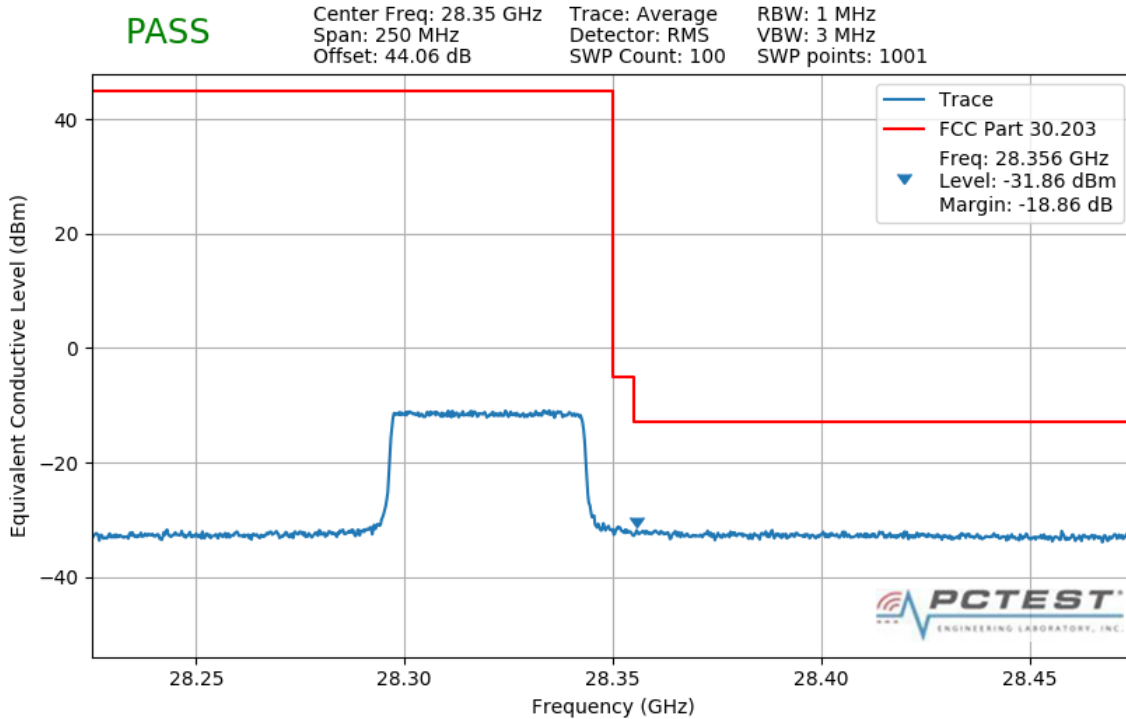


**Plot 7-199. Lower Band Edge Plot (4CC 400MHz 16QAM 1 RB)**

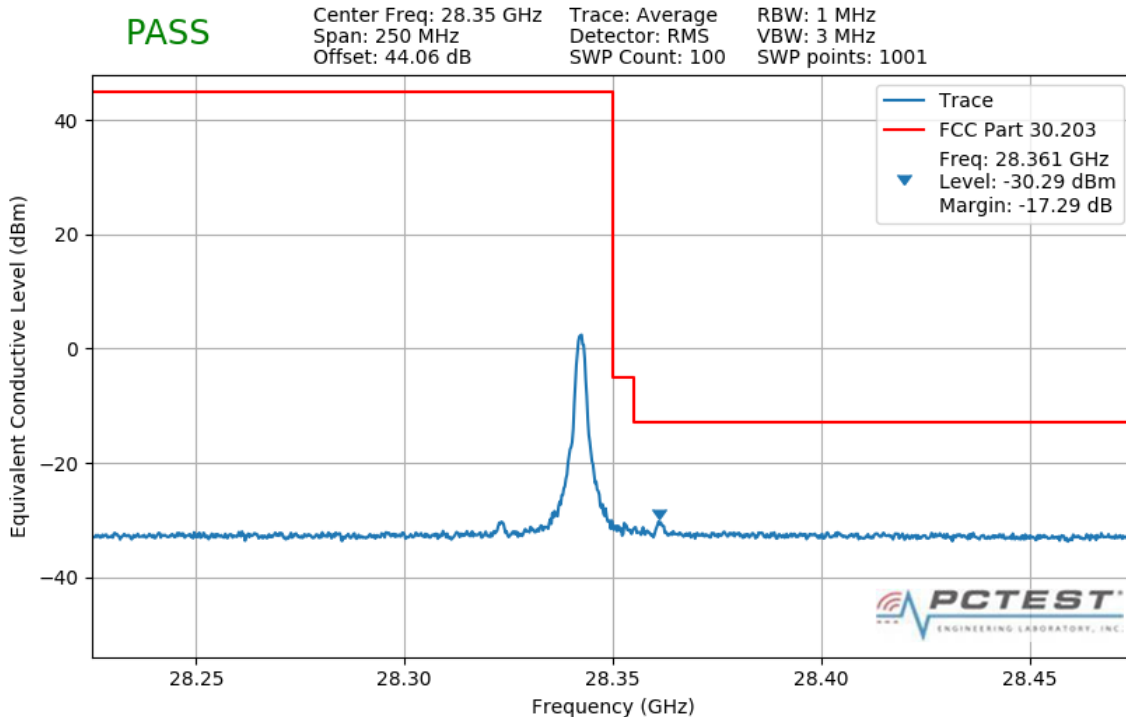


**Plot 7-200. Lower Band Edge Plot (4CC 400MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
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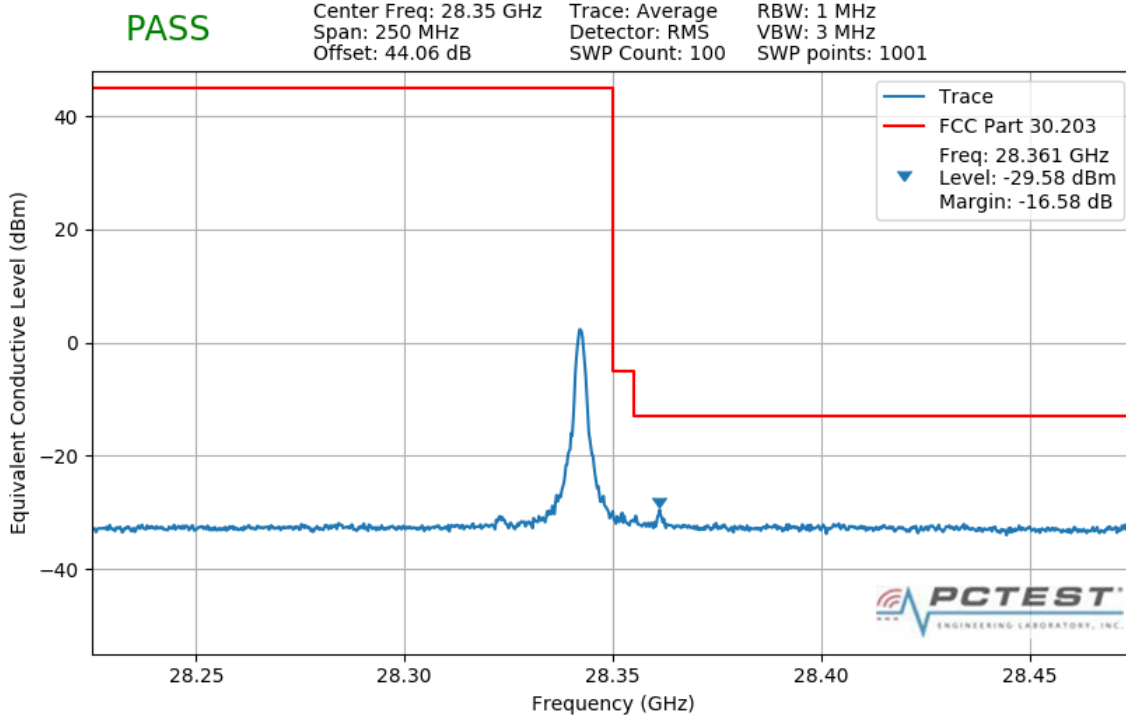
**Plot 7-201. Upper Band Edge Plot (1CC 50MHz QPSK Full RB)**



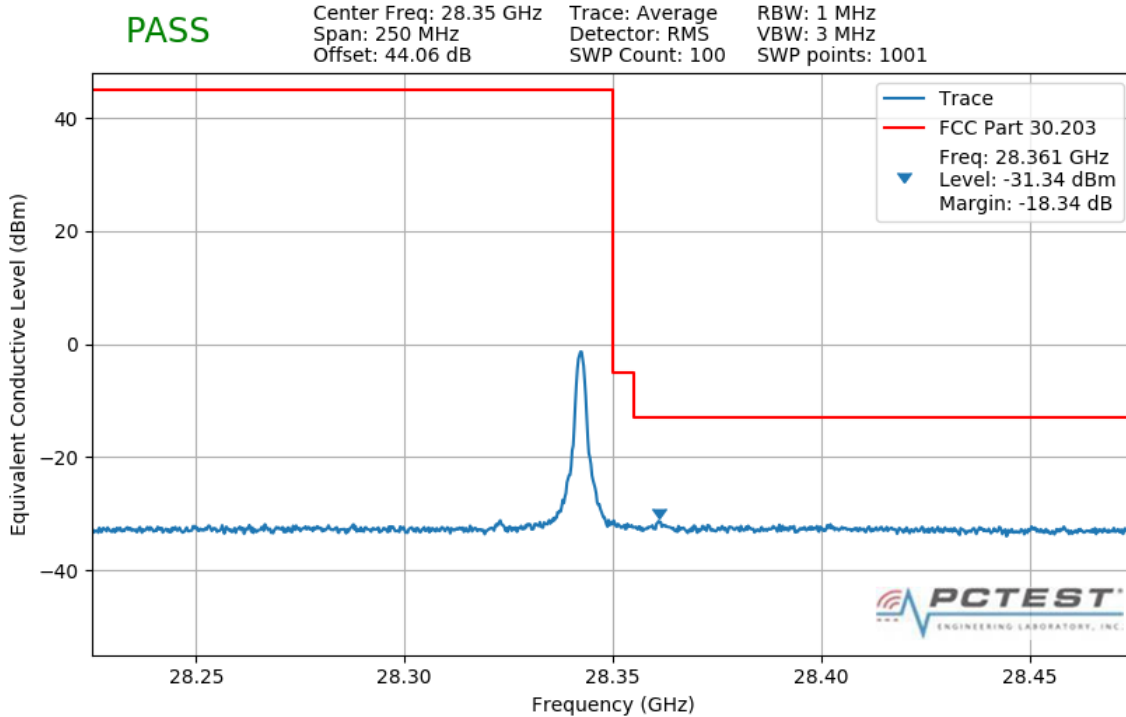
**Plot 7-202. Upper Band Edge Plot (1CC 50MHz QPSK 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 148 of 337



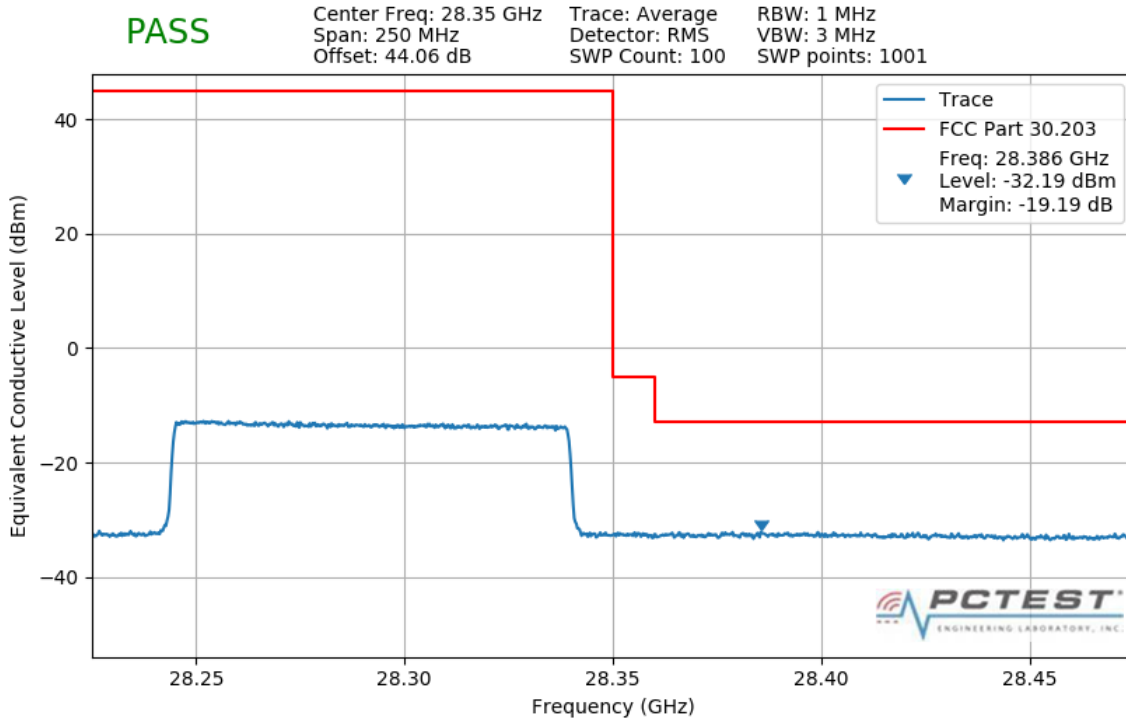


**Plot 7-203. Upper Band Edge Plot (1CC 50MHz 16QAM 1 RB)**

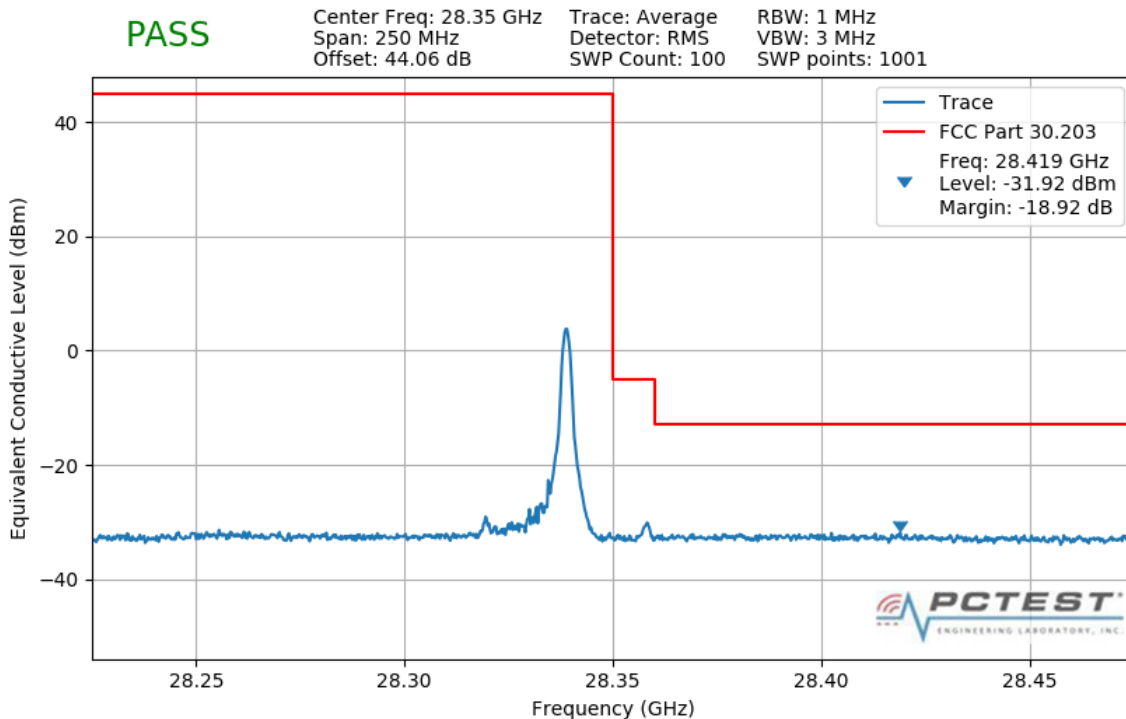


**Plot 7-204. Upper Band Edge Plot (1CC 50MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 149 of 337

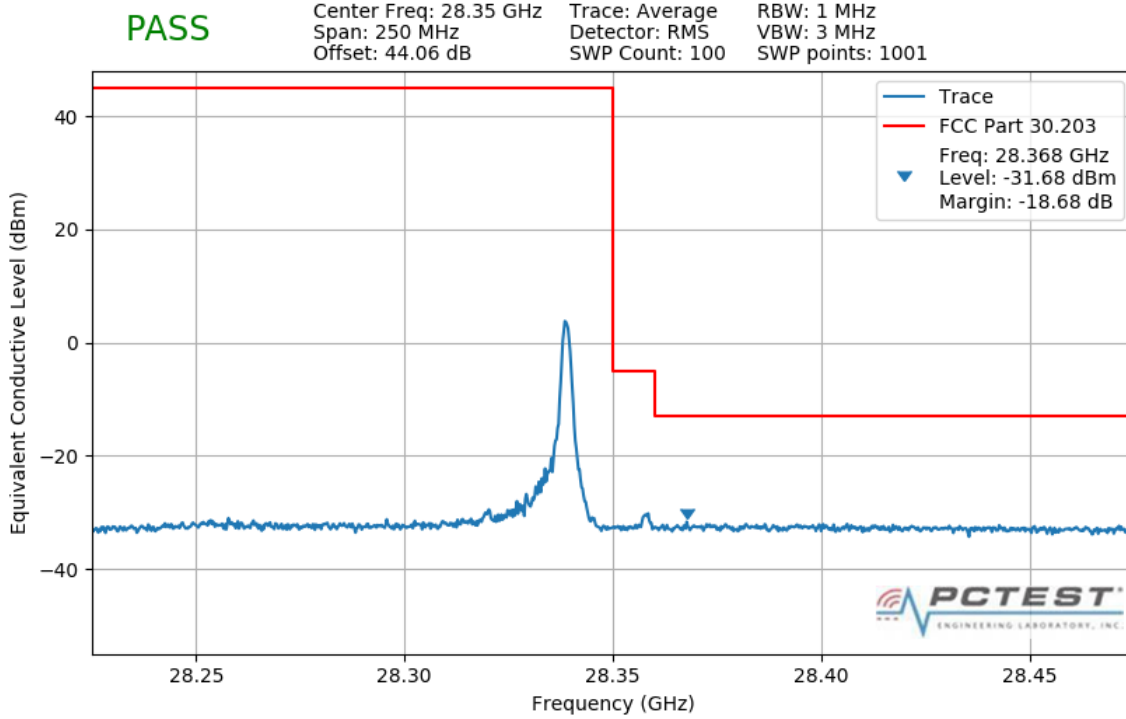


**Plot 7-205. Upper Band Edge Plot (1CC 100MHz QPSK Full RB)**

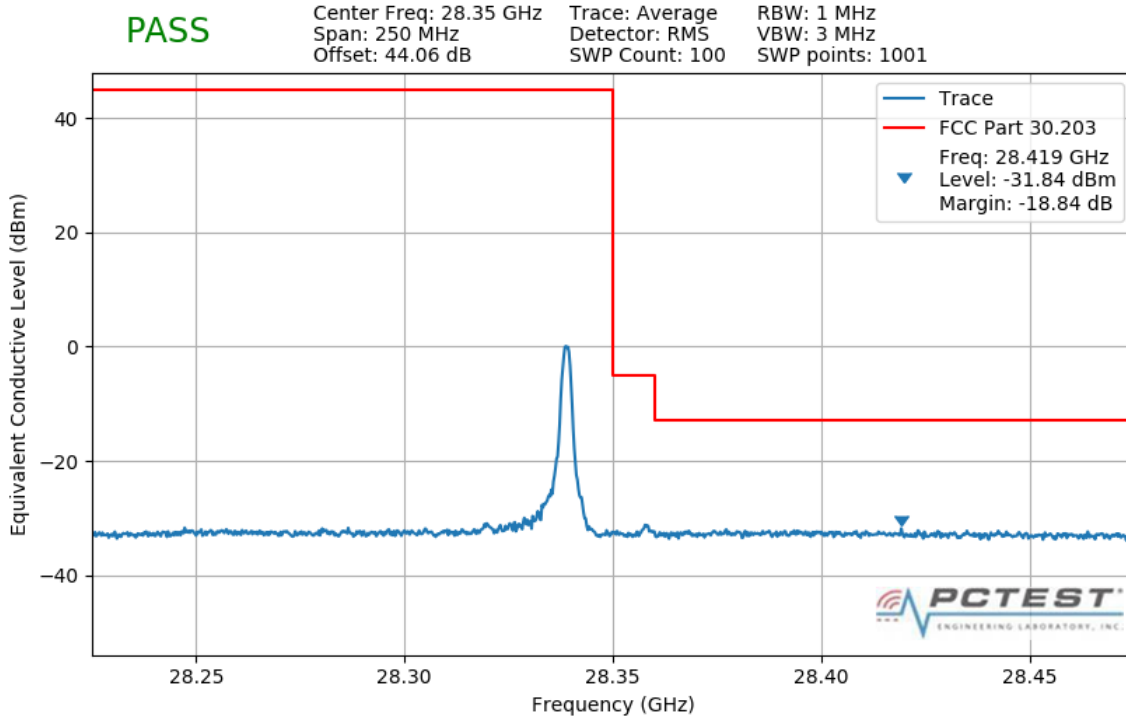


**Plot 7-206. Upper Band Edge Plot (1CC 100MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 150 of 337

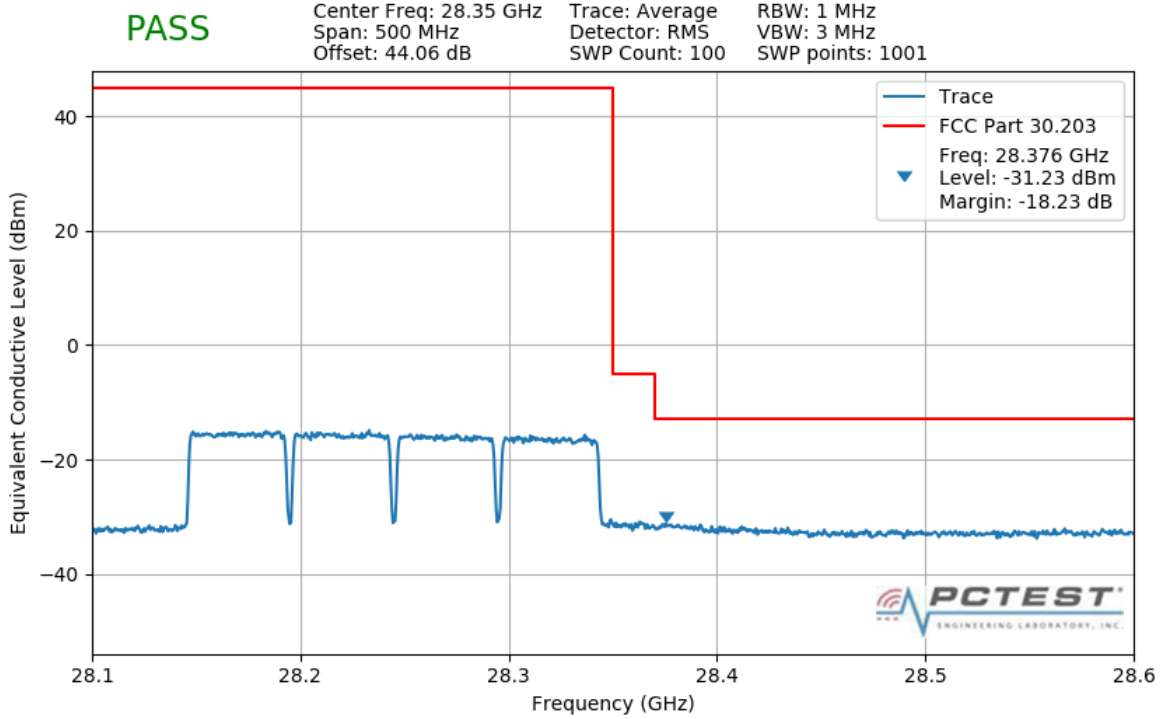


**Plot 7-207. Upper Band Edge Plot (1CC 100MHz 16QAM 1 RB)**

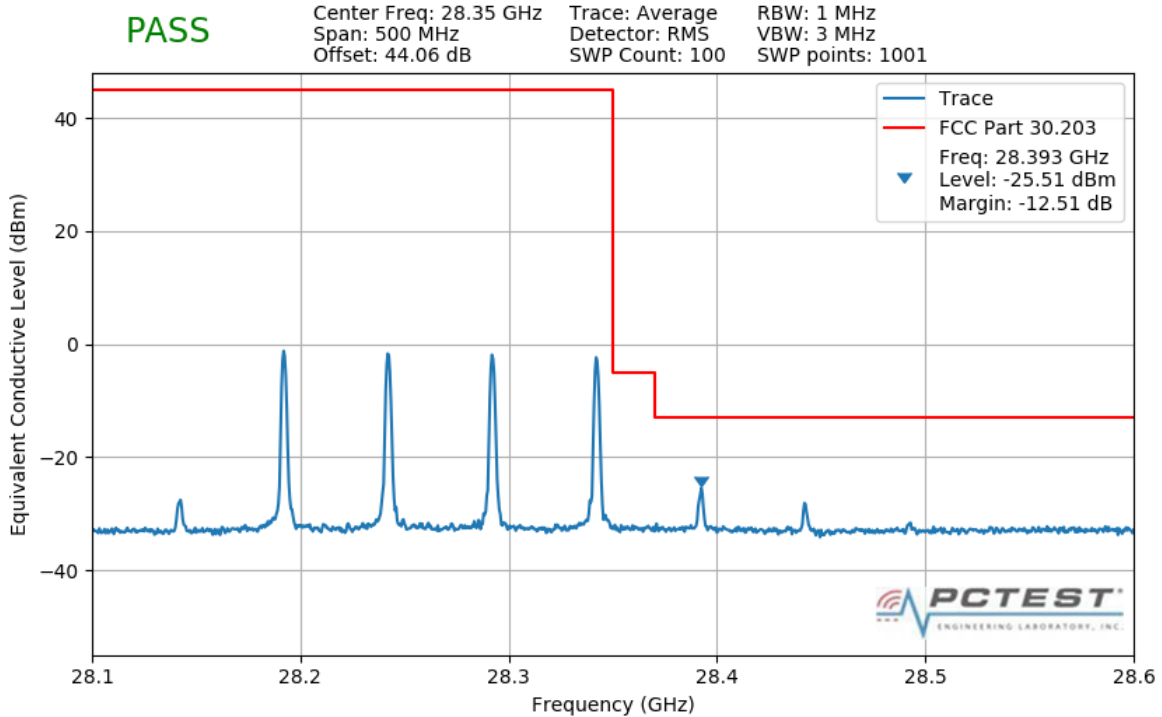


**Plot 7-208. Upper Band Edge Plot (1CC 100MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 151 of 337

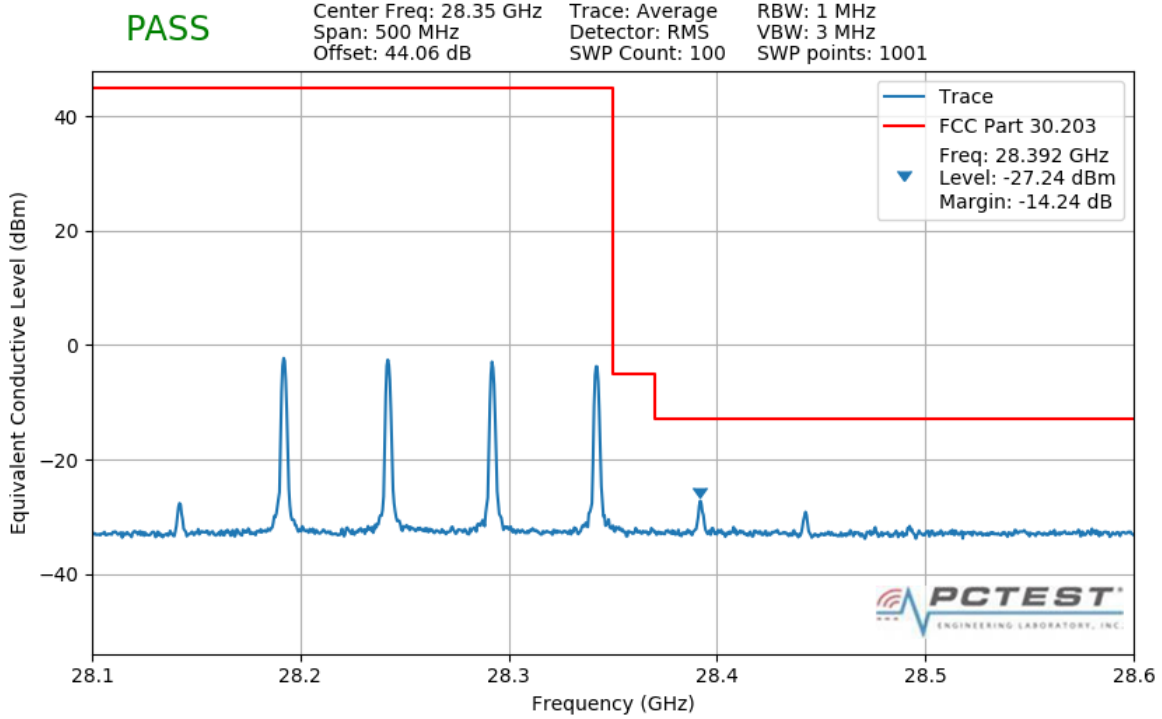


**Plot 7-209. Upper Band Edge Plot (4CC 200MHz QPSK Full RB)**

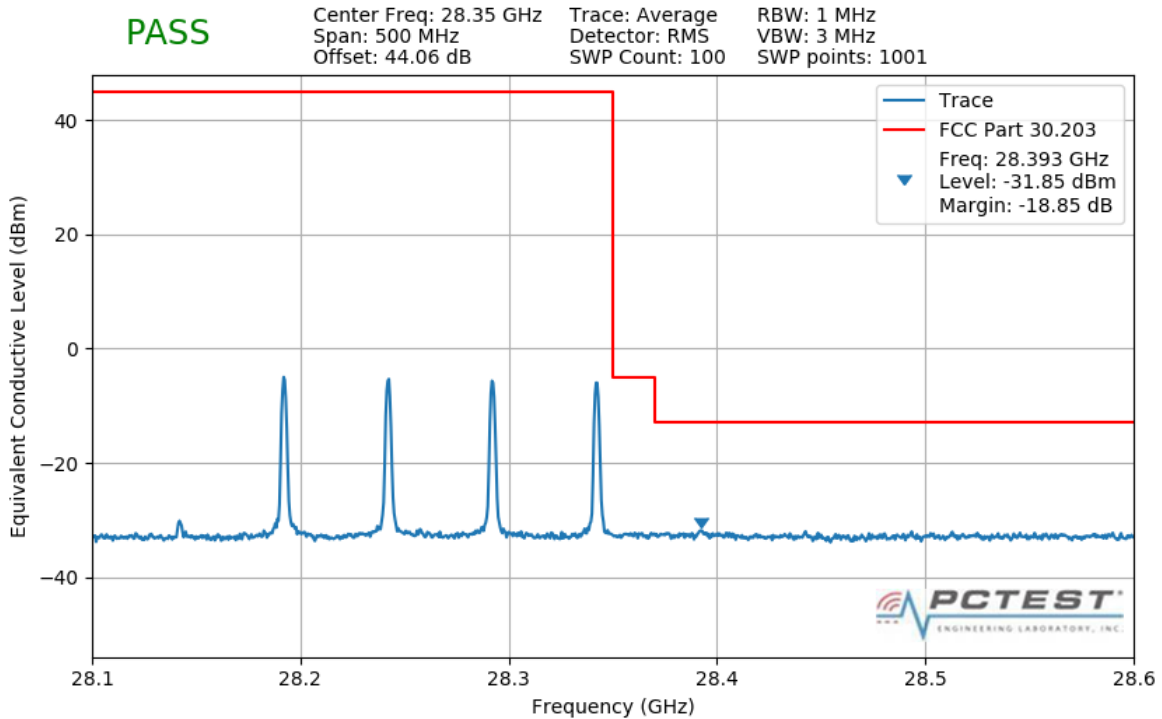


**Plot 7-210. Upper Band Edge Plot (4CC 200MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 152 of 337

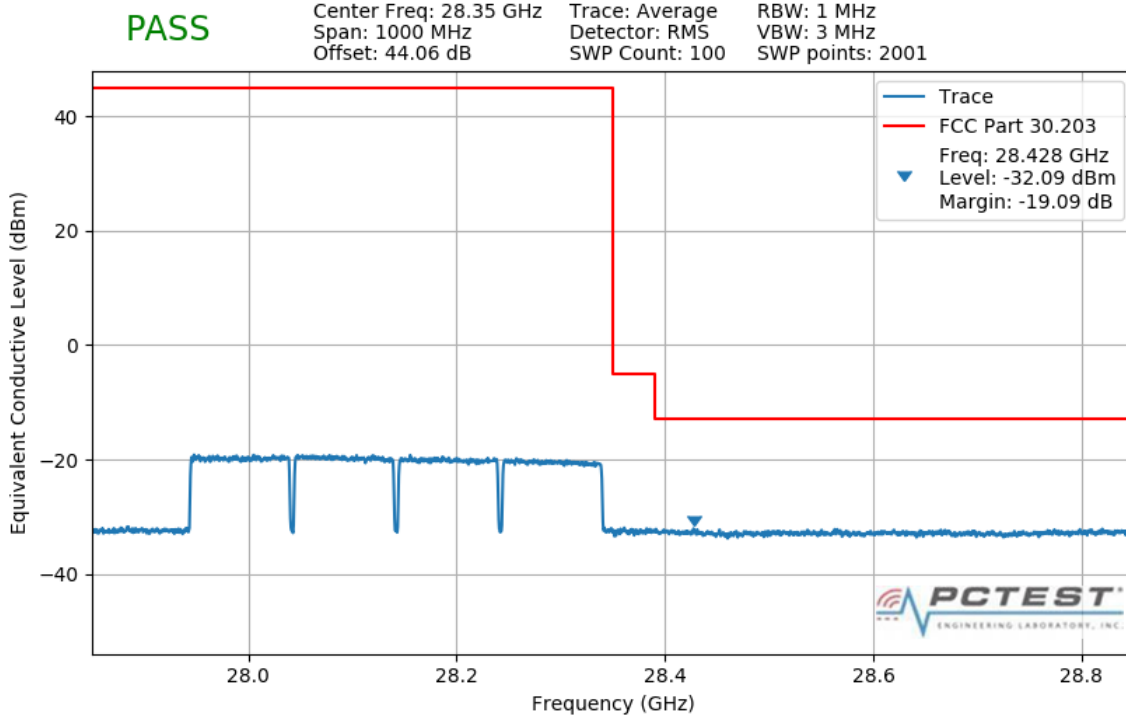


**Plot 7-211. Upper Band Edge Plot (4CC 200MHz 16QAM 1 RB)**

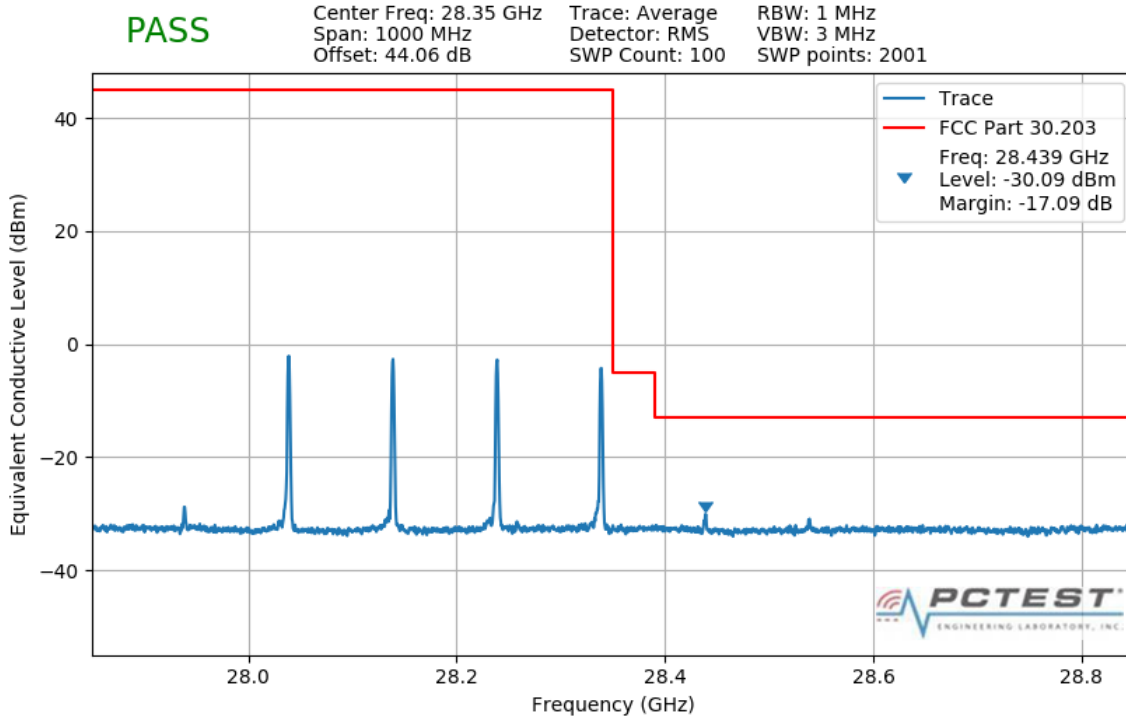


**Plot 7-212. Upper Band Edge Plot (4CC 200MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 153 of 337

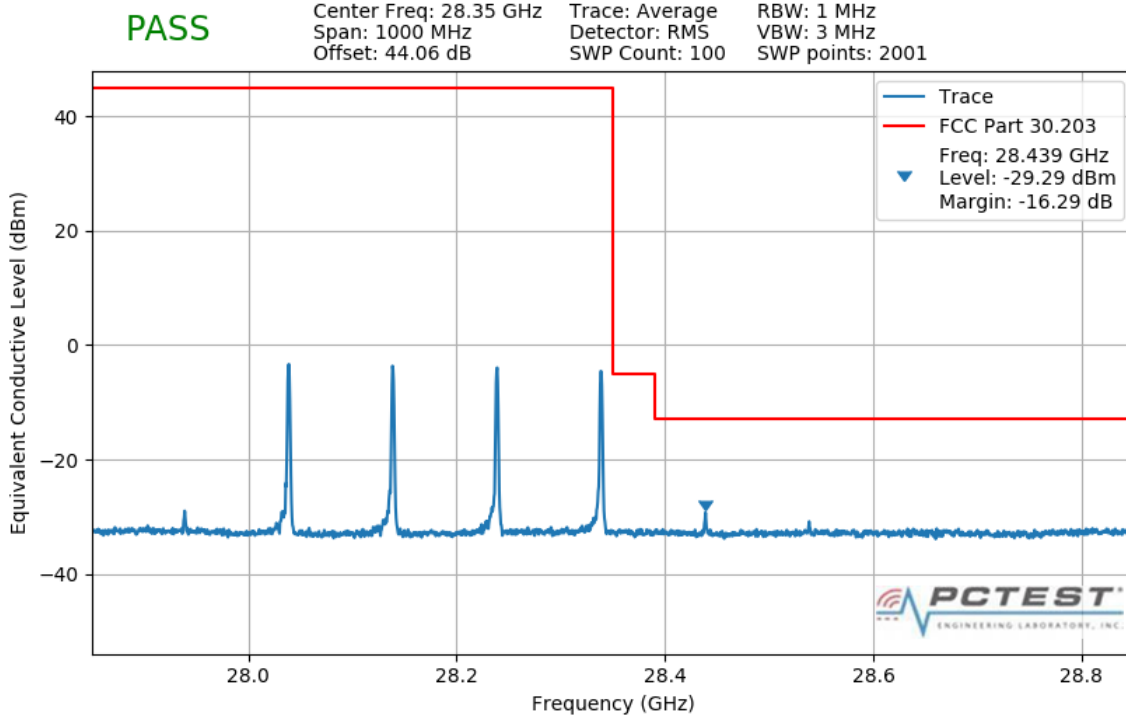


**Plot 7-213. Upper Band Edge Plot (4CC 400MHz QPSK Full RB)**

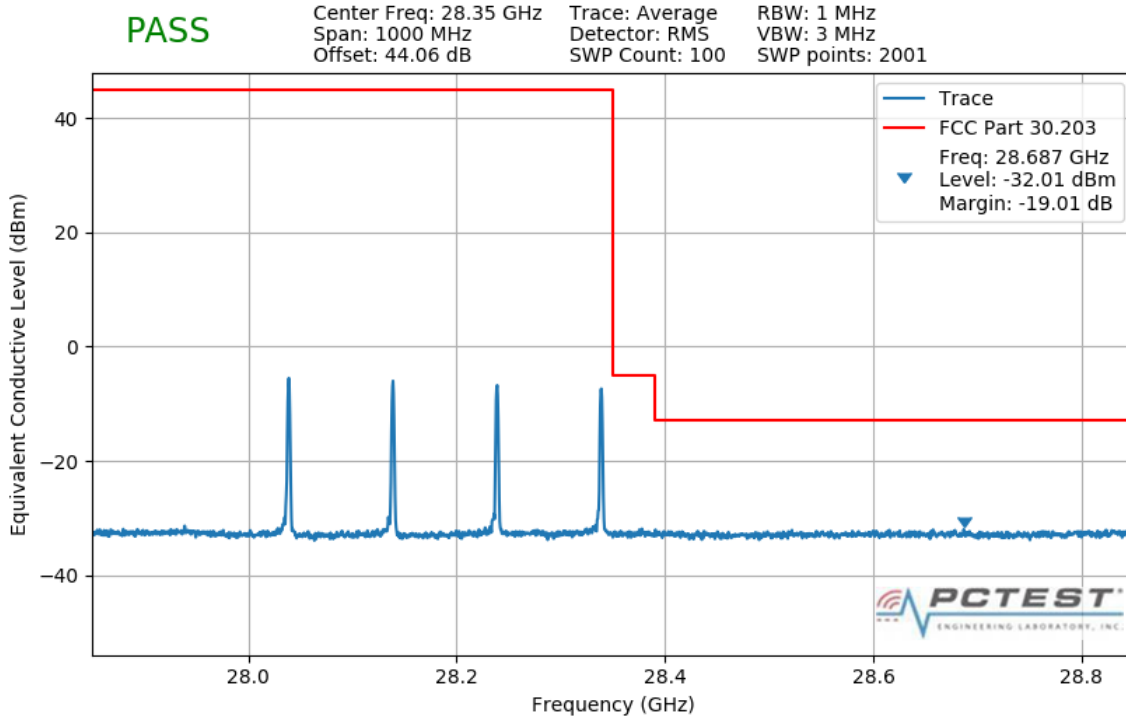


**Plot 7-214. Upper Band Edge Plot (4CC 400MHz QPSK 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 154 of 337



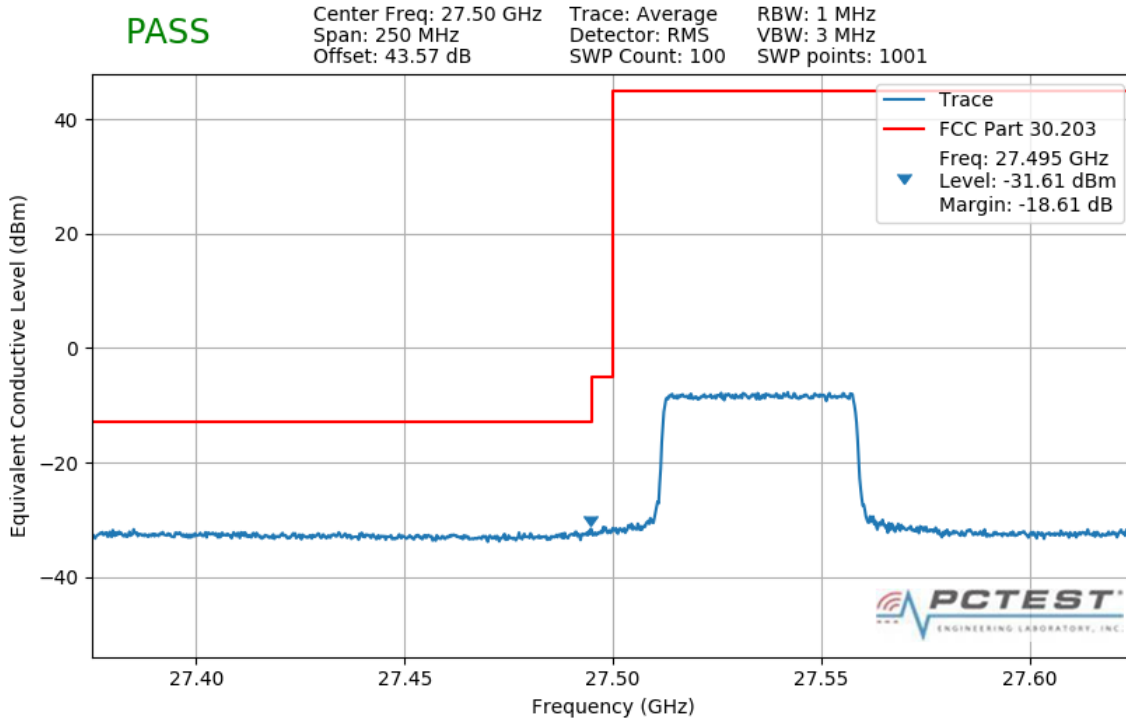
**Plot 7-215. Upper Band Edge Plot (4CC 400MHz 16QAM 1 RB)**



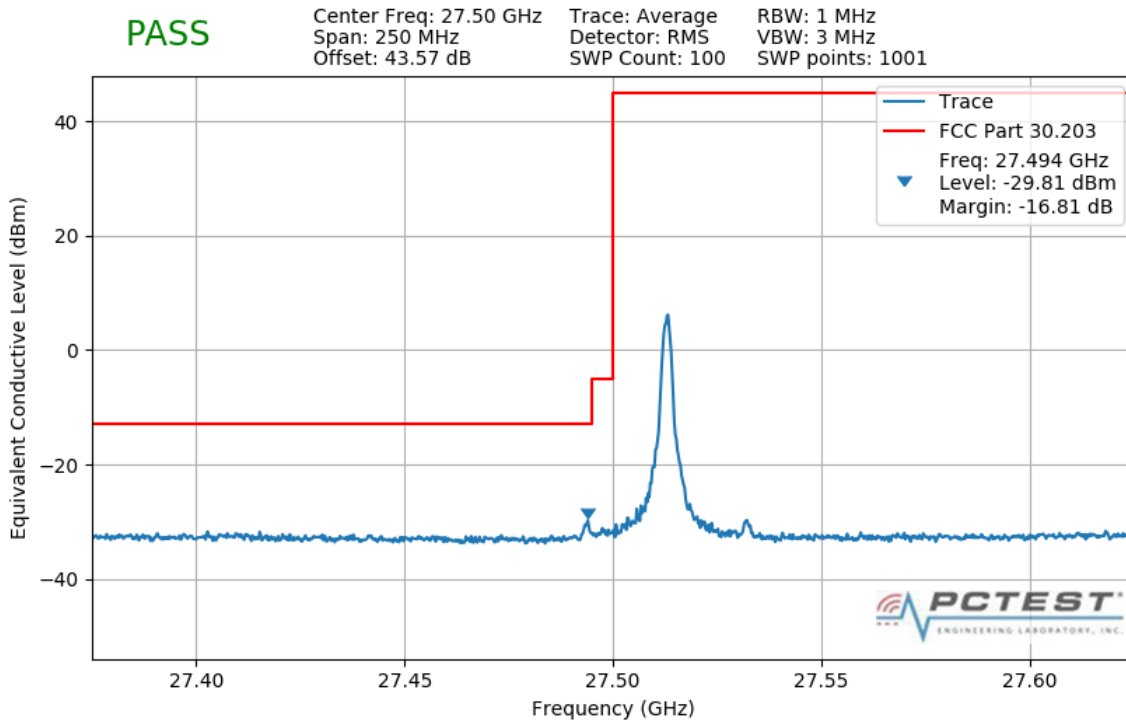
**Plot 7-216. Upper Band Edge Plot (4CC 400MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 155 of 337

# V Beam



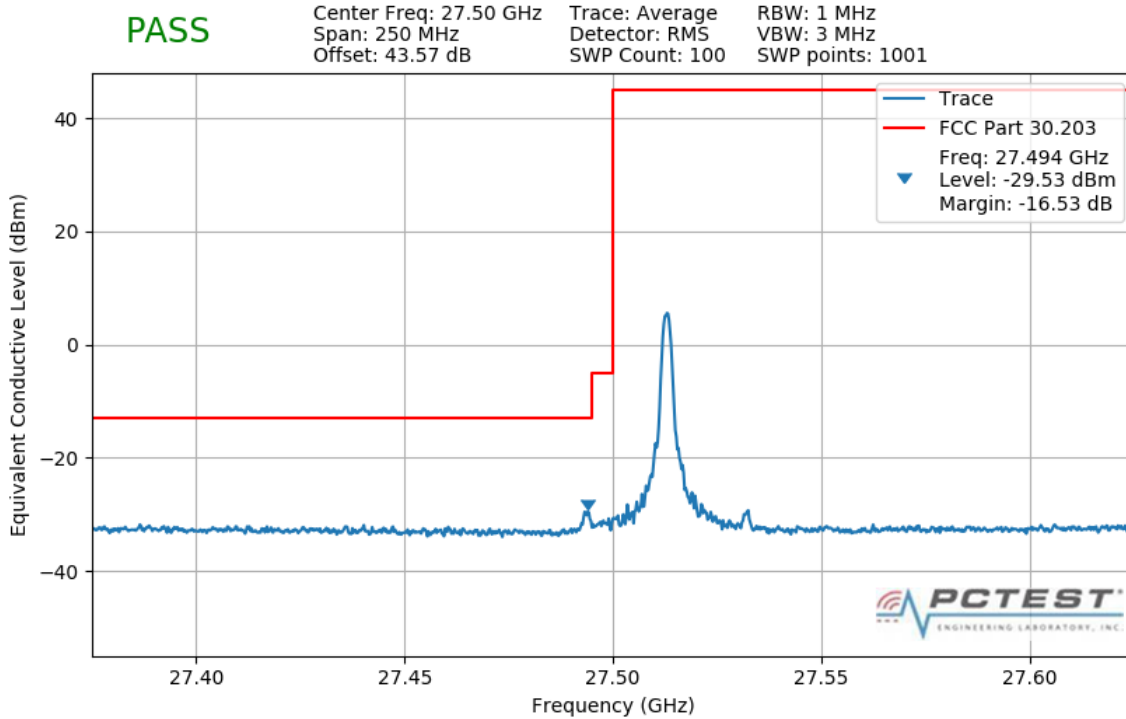
**Plot 7-217. Lower Band Edge Plot (1CC 50MHz QPSK Full RB)**



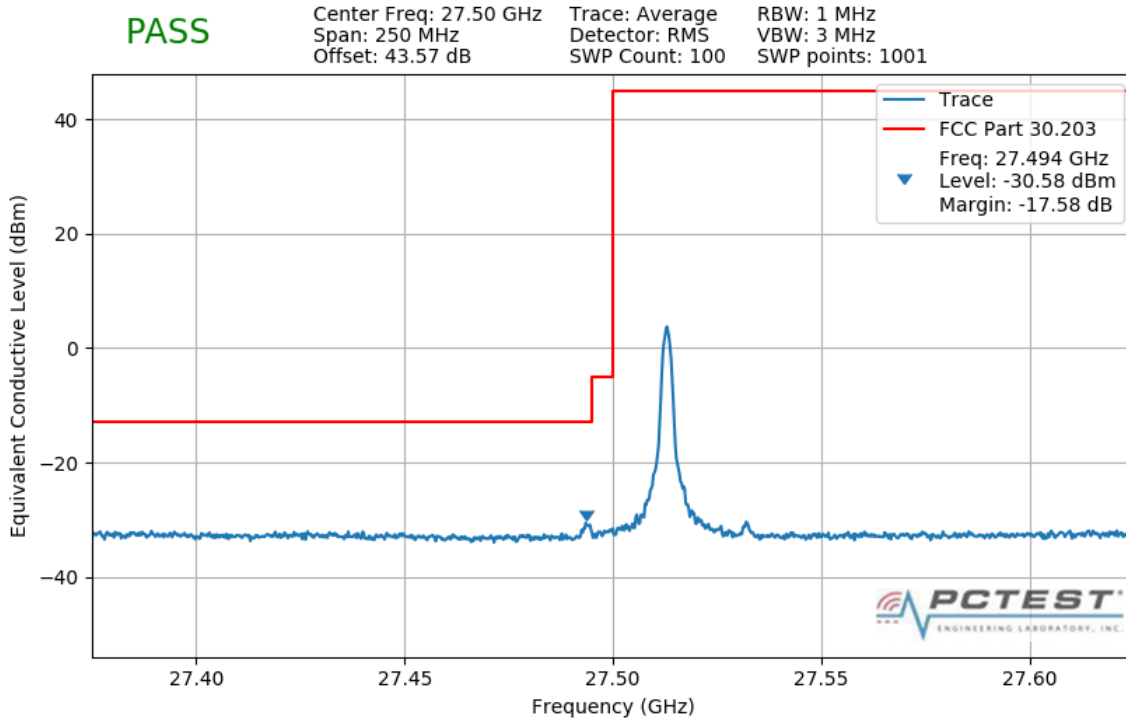
**Plot 7-218. Lower Band Edge Plot (1CC 50MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 156 of 337



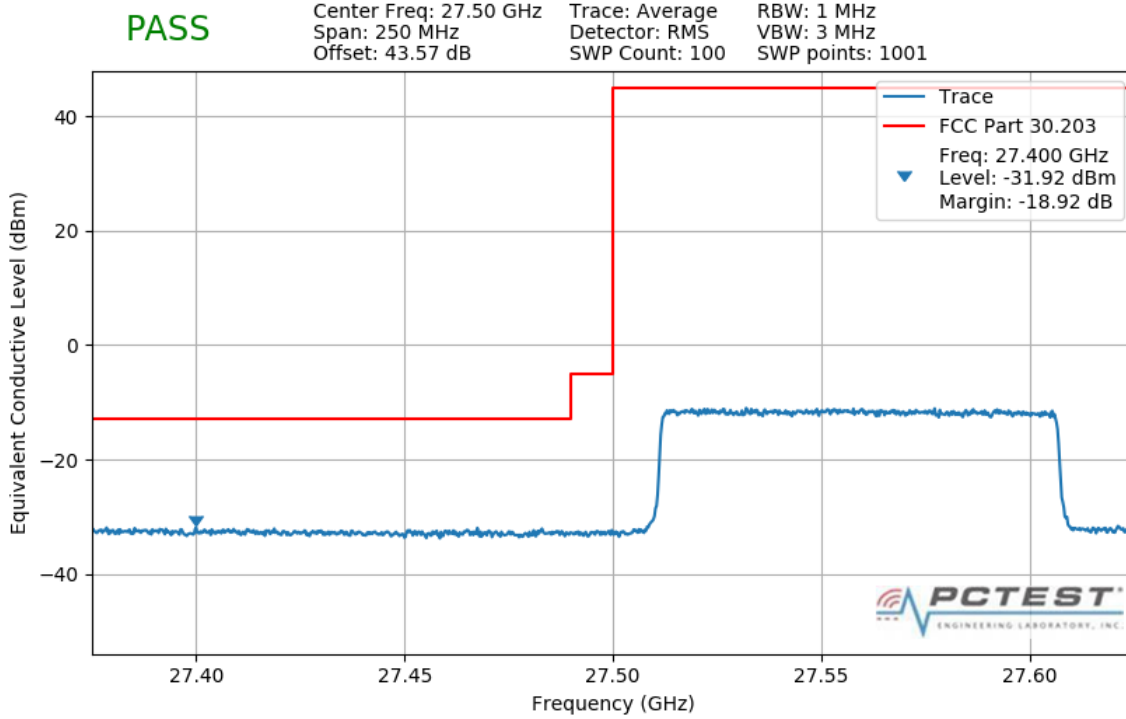


**Plot 7-219. Lower Band Edge Plot (1CC 50MHz 16QAM 1 RB)**

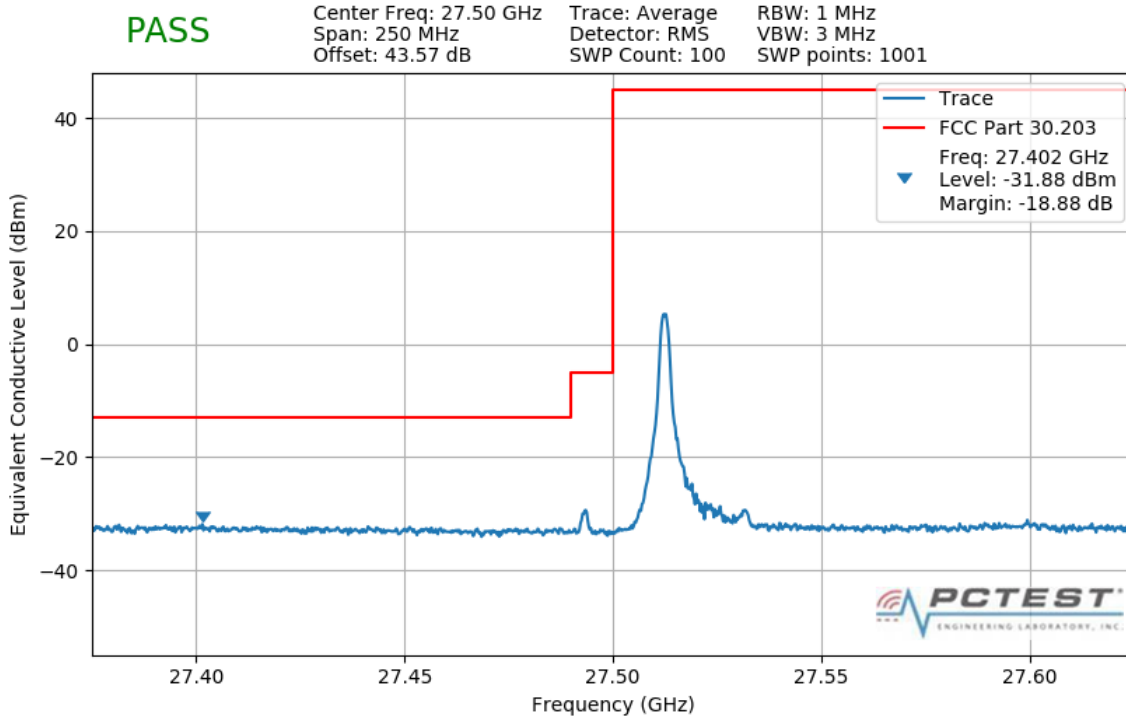


**Plot 7-220. Lower Band Edge Plot (1CC 50MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 157 of 337

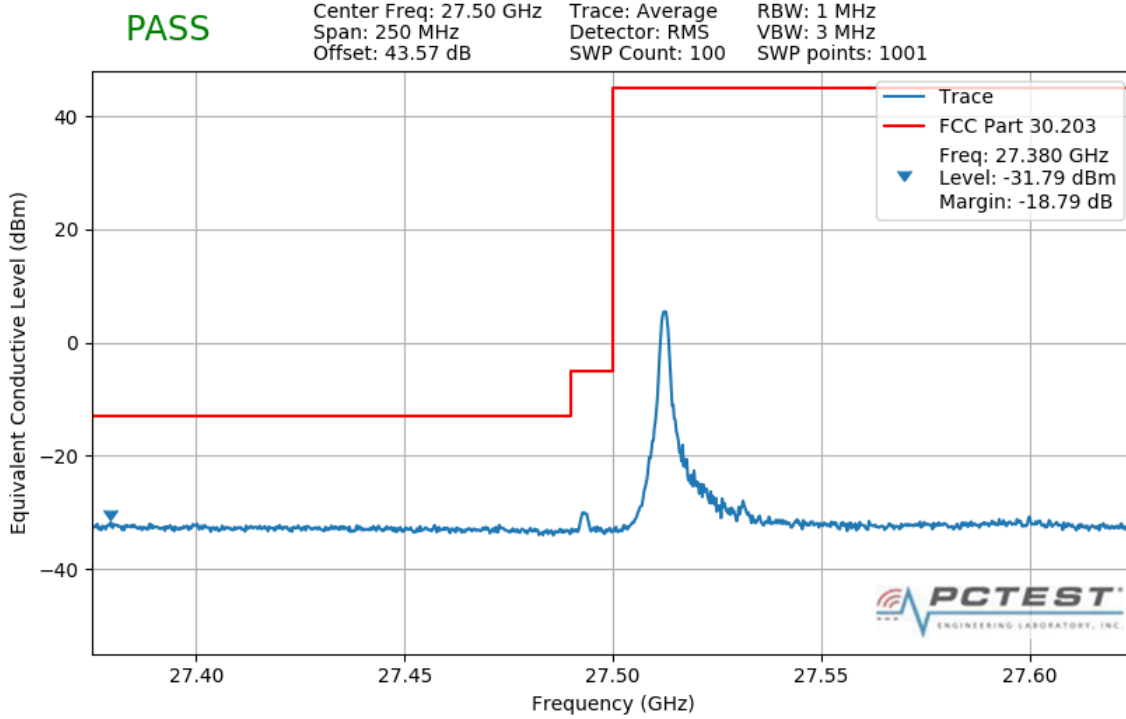


**Plot 7-221. Lower Band Edge Plot (1CC 100MHz QPSK Full RB)**

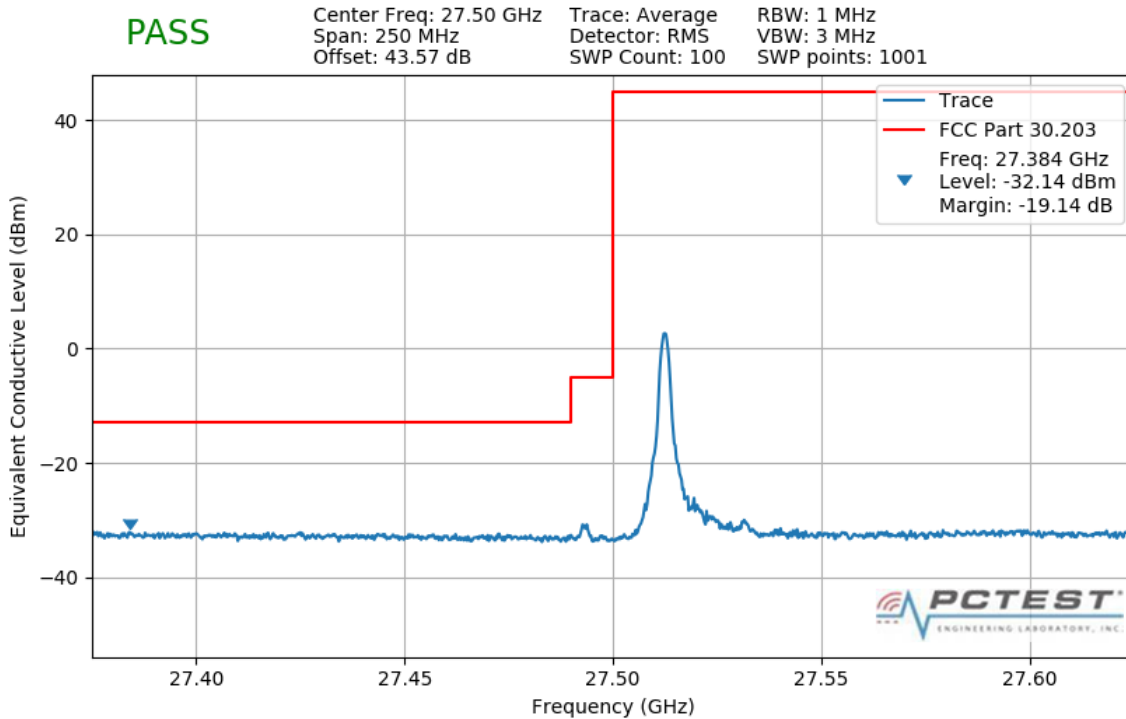


**Plot 7-222. Lower Band Edge Plot (1CC 100MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 158 of 337

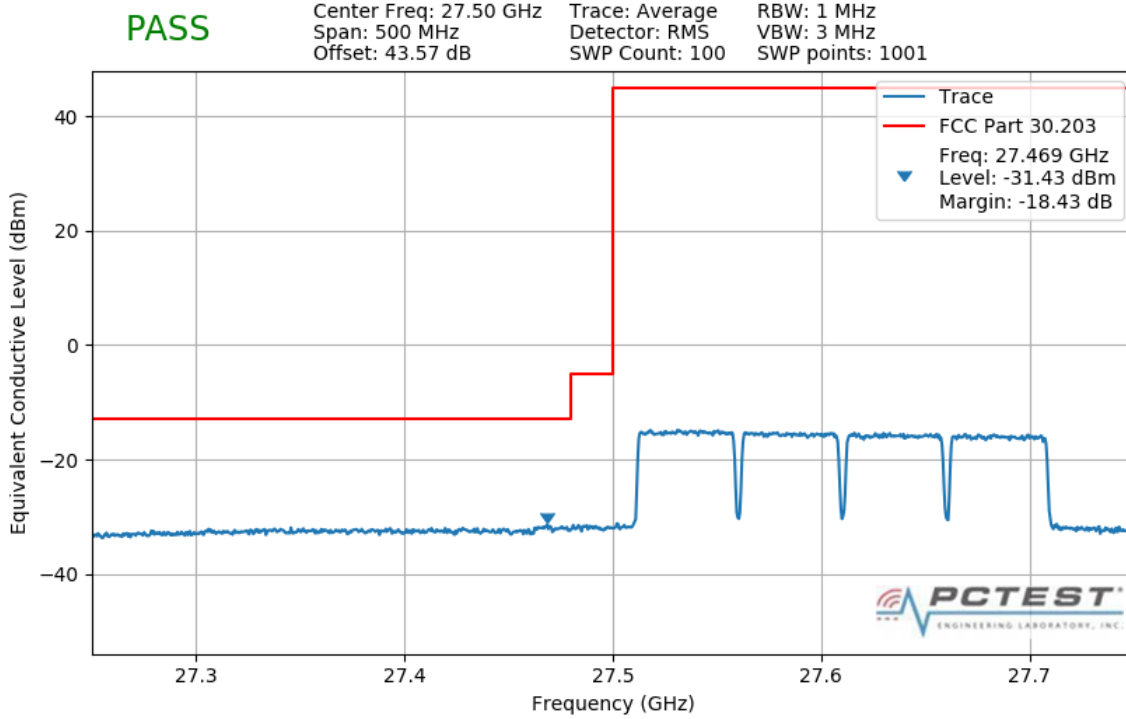


**Plot 7-223. Lower Band Edge Plot (1CC 100MHz 16QAM 1 RB)**

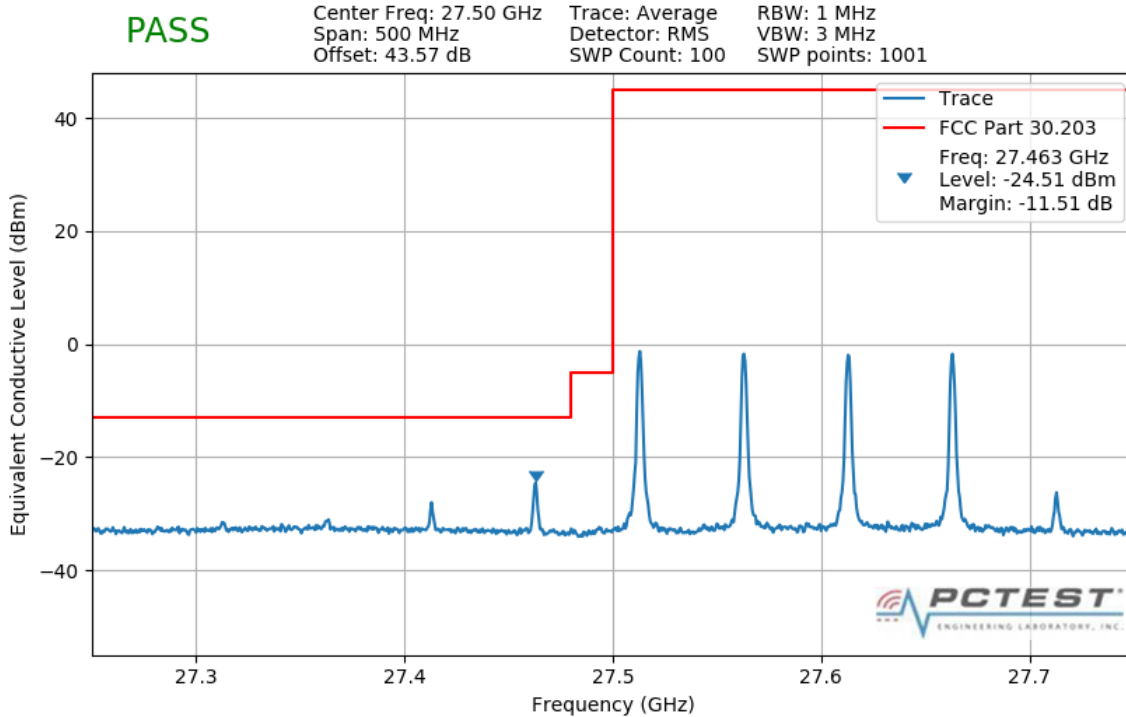


**Plot 7-224. Lower Band Edge Plot (1CC 100MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 159 of 337

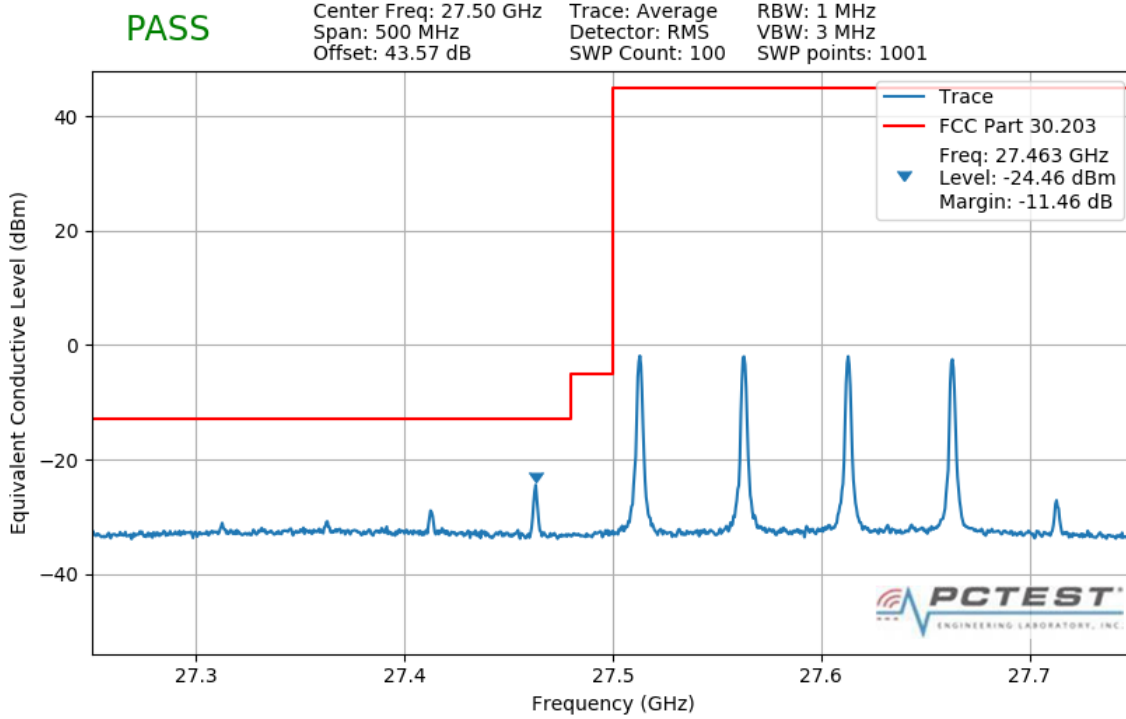


**Plot 7-225. Lower Band Edge Plot (4CC 200MHz QPSK Full RB)**

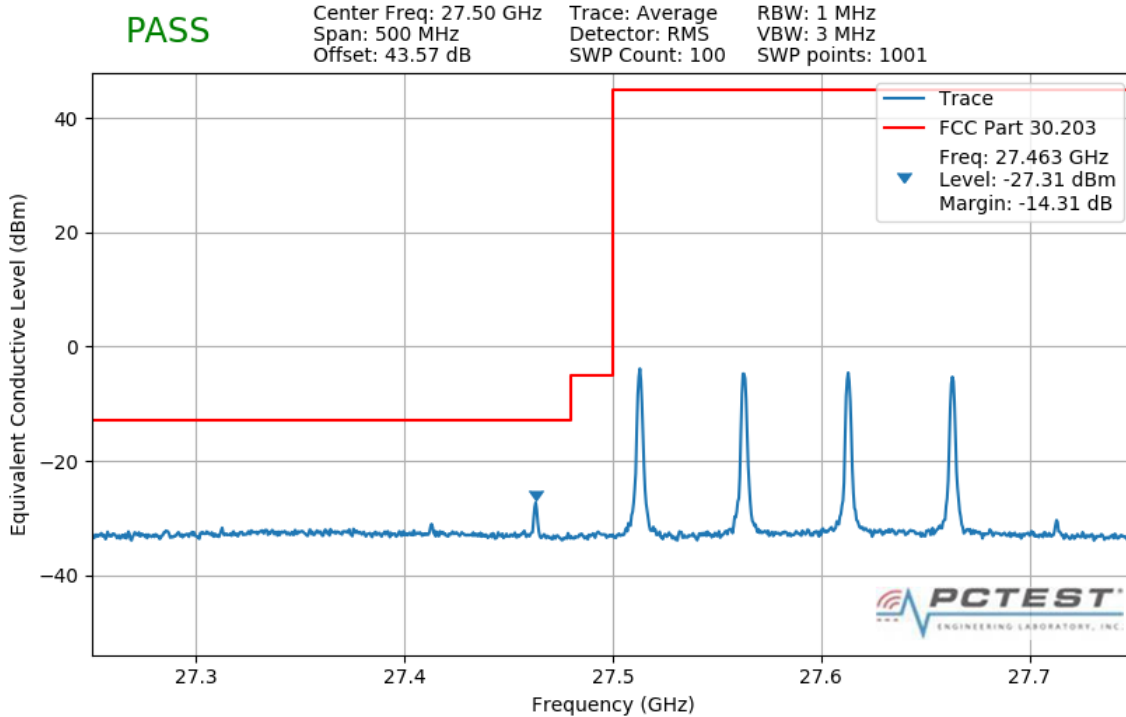


**Plot 7-226. Lower Band Edge Plot (4CC 200MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 160 of 337

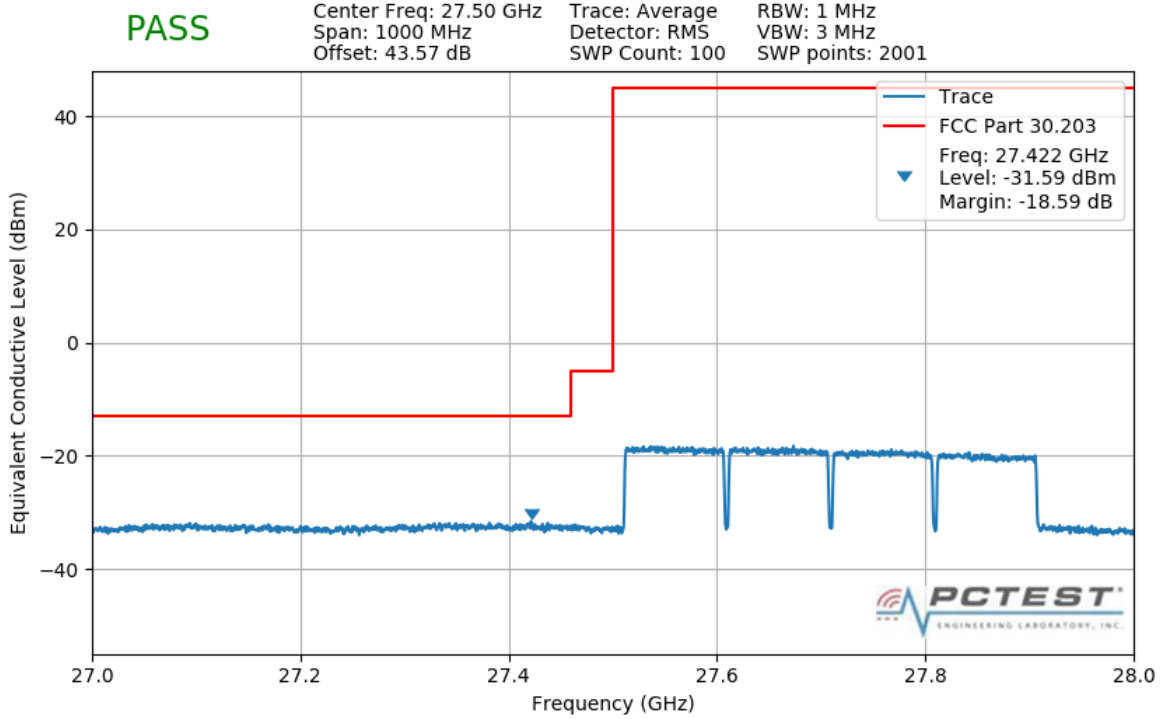


**Plot 7-227. Lower Band Edge Plot (4CC 200MHz 16QAM 1 RB)**

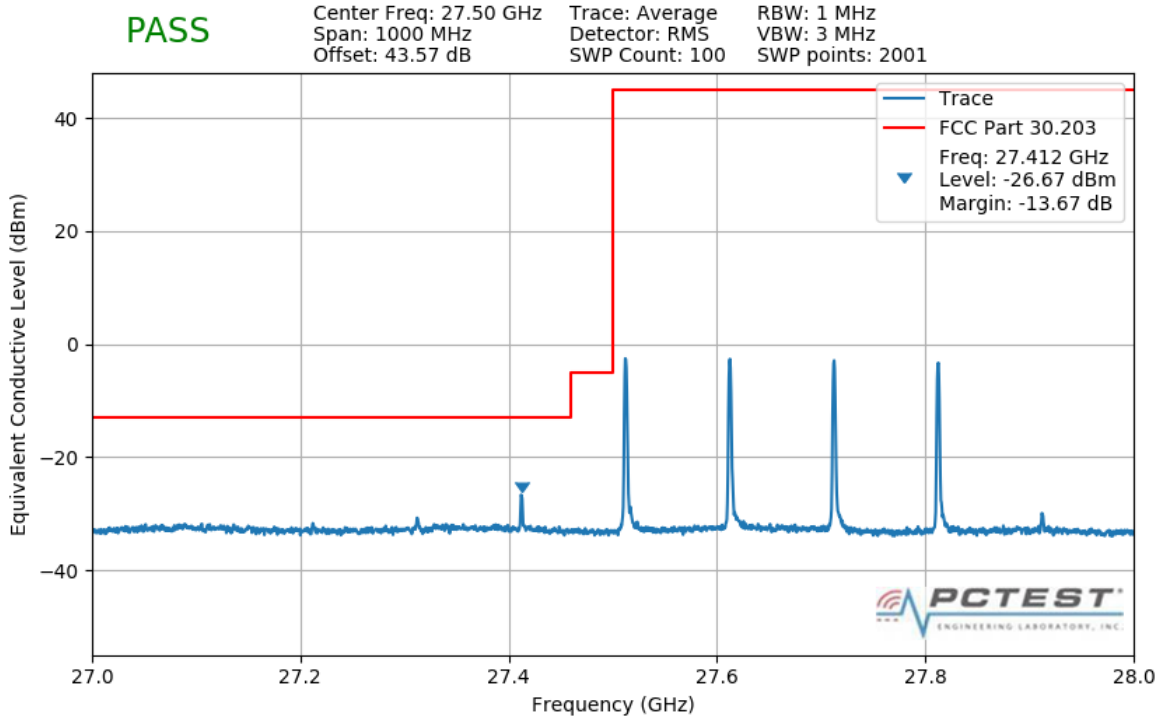


**Plot 7-228. Lower Band Edge Plot (4CC 200MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 161 of 337

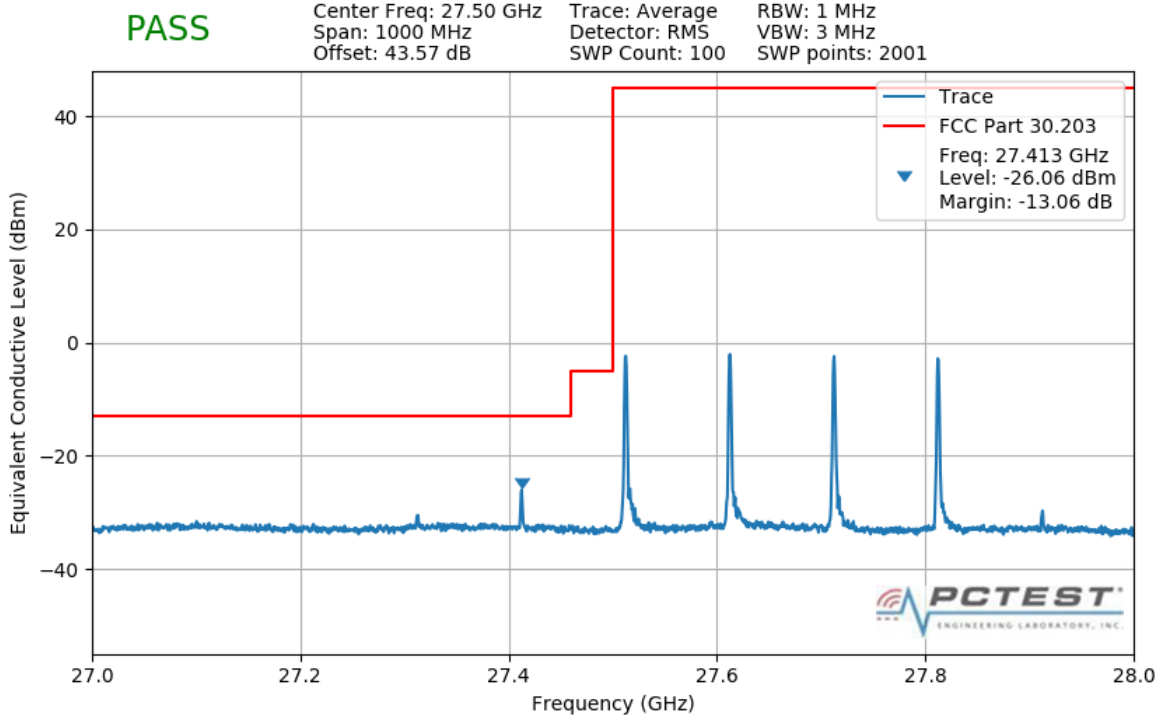


**Plot 7-229. Lower Band Edge Plot (4CC 400MHz QPSK Full RB)**

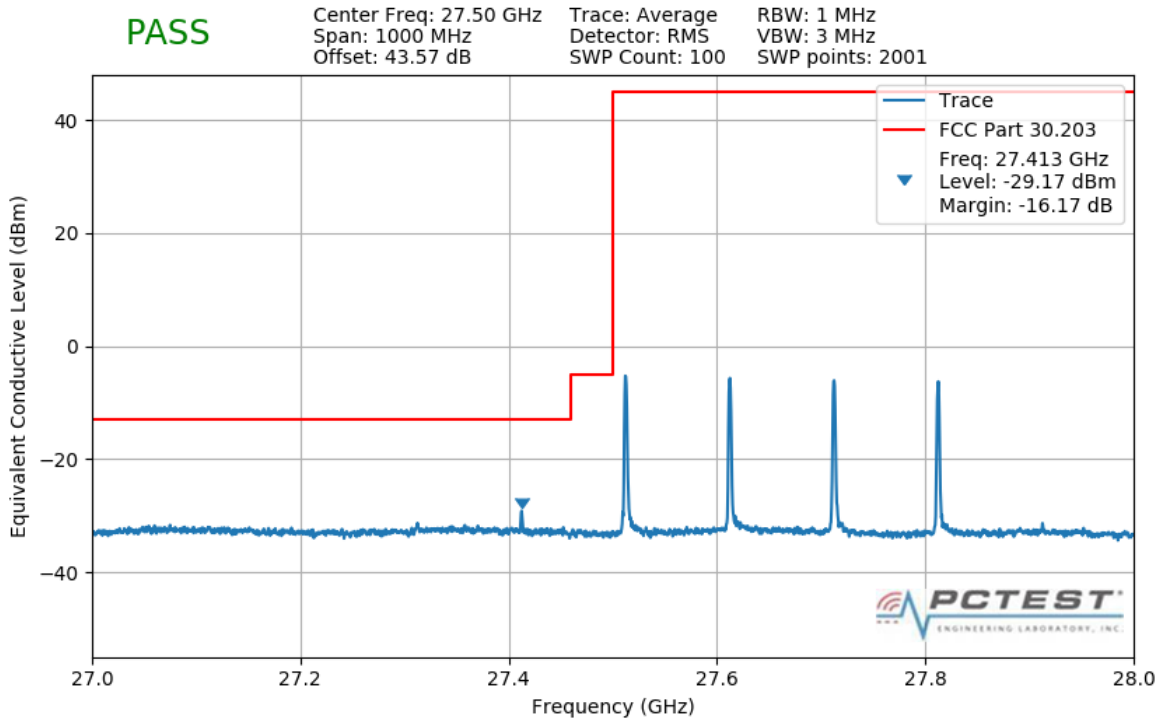


**Plot 7-230. Lower Band Edge Plot (4CC 400MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 162 of 337

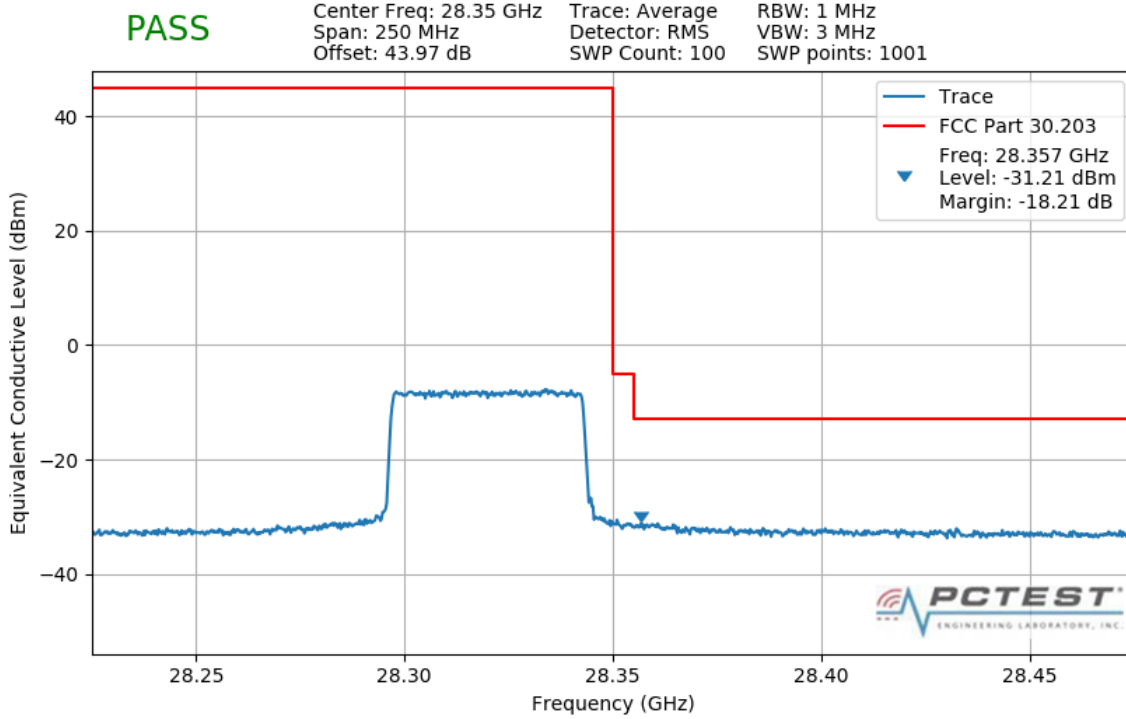


**Plot 7-231. Lower Band Edge Plot (4CC 400MHz 16QAM 1 RB)**

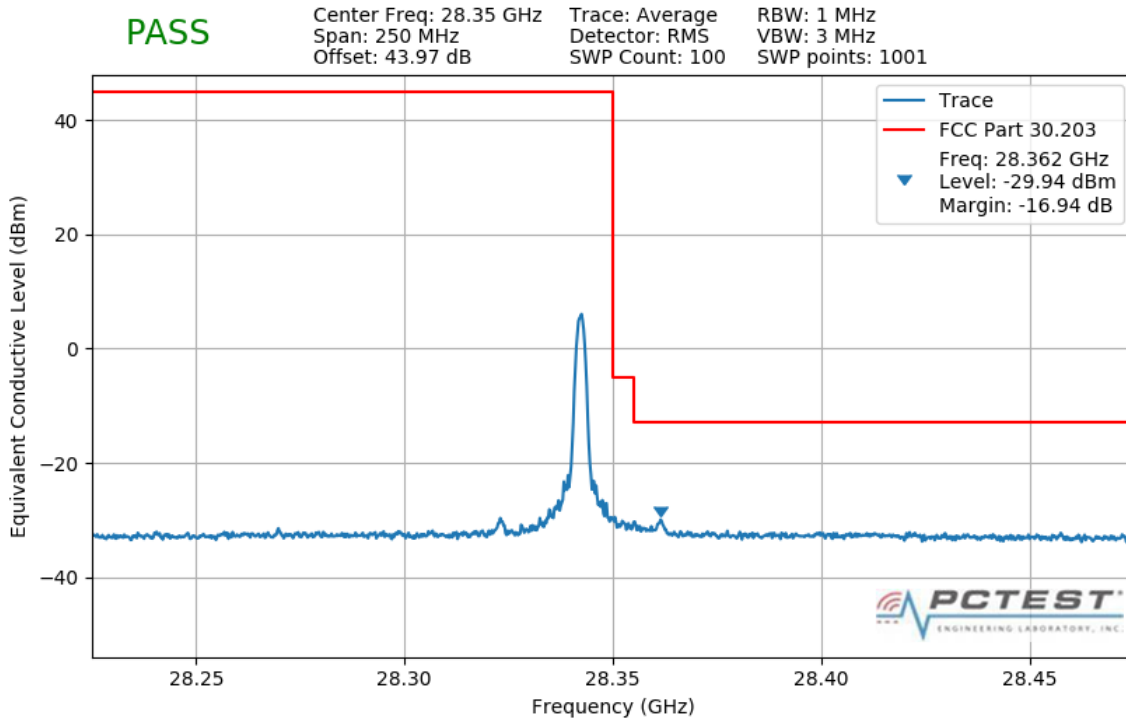


**Plot 7-232. Lower Band Edge Plot (4CC 400MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 163 of 337



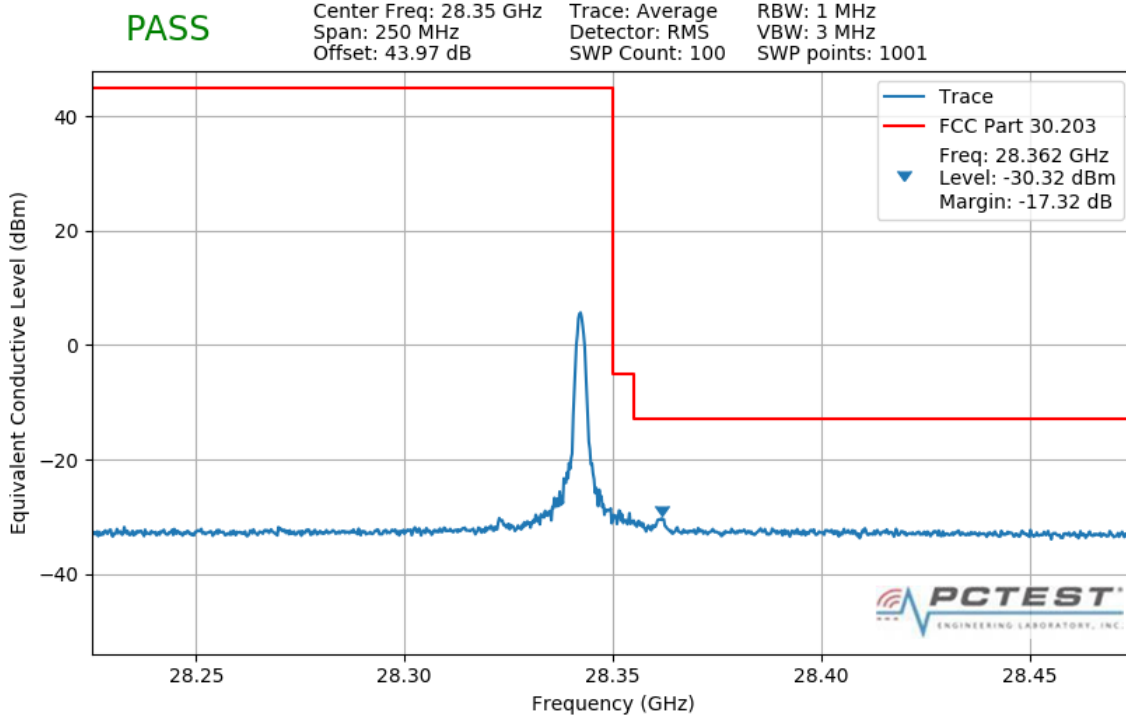
**Plot 7-233. Upper Band Edge Plot (1CC 50MHz QPSK Full RB)**



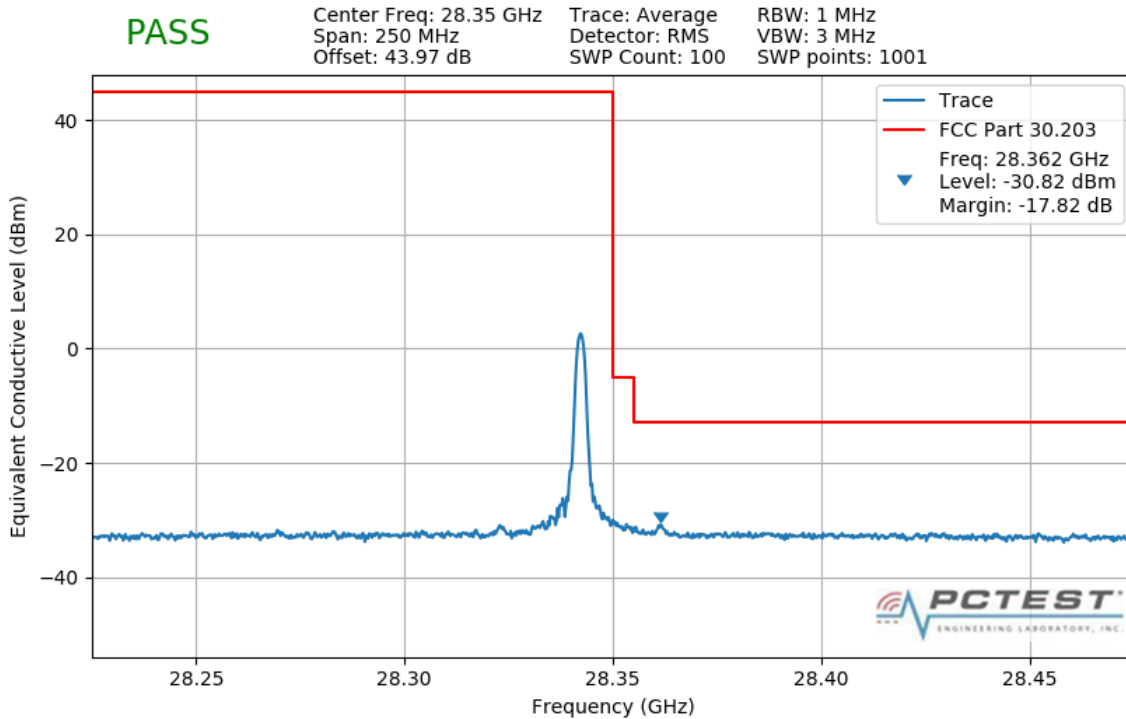
**Plot 7-234. Upper Band Edge Plot (1CC 50MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 164 of 337



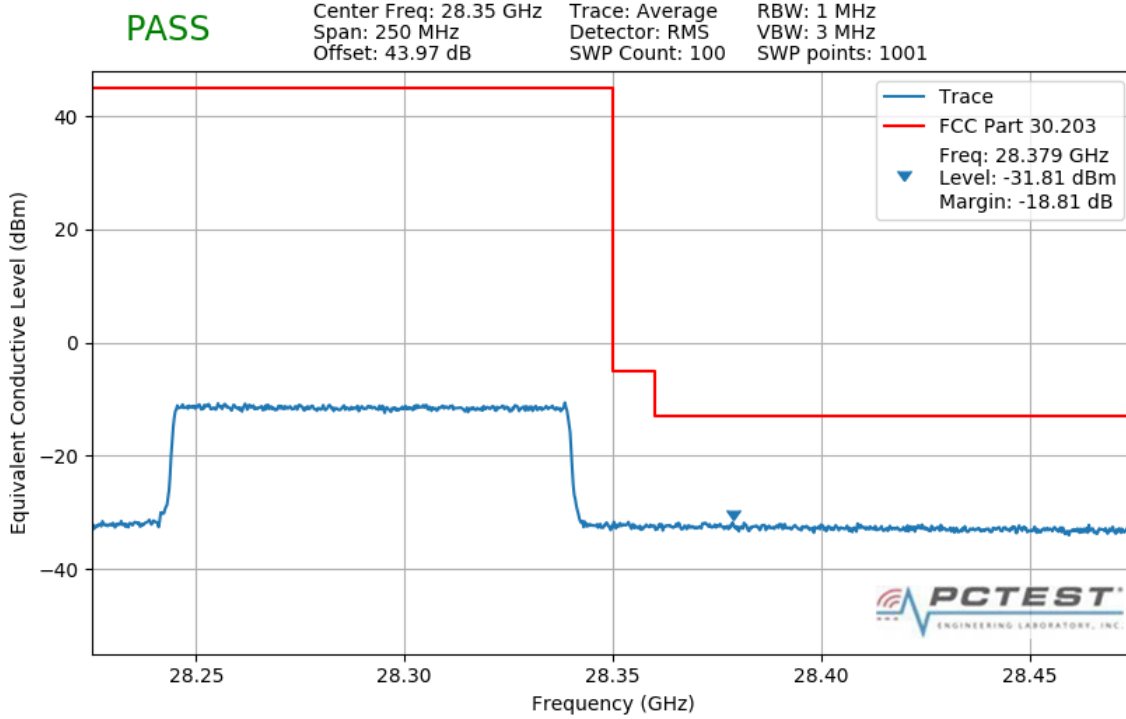


**Plot 7-235. Upper Band Edge Plot (1CC 50MHz 16QAM 1 RB)**

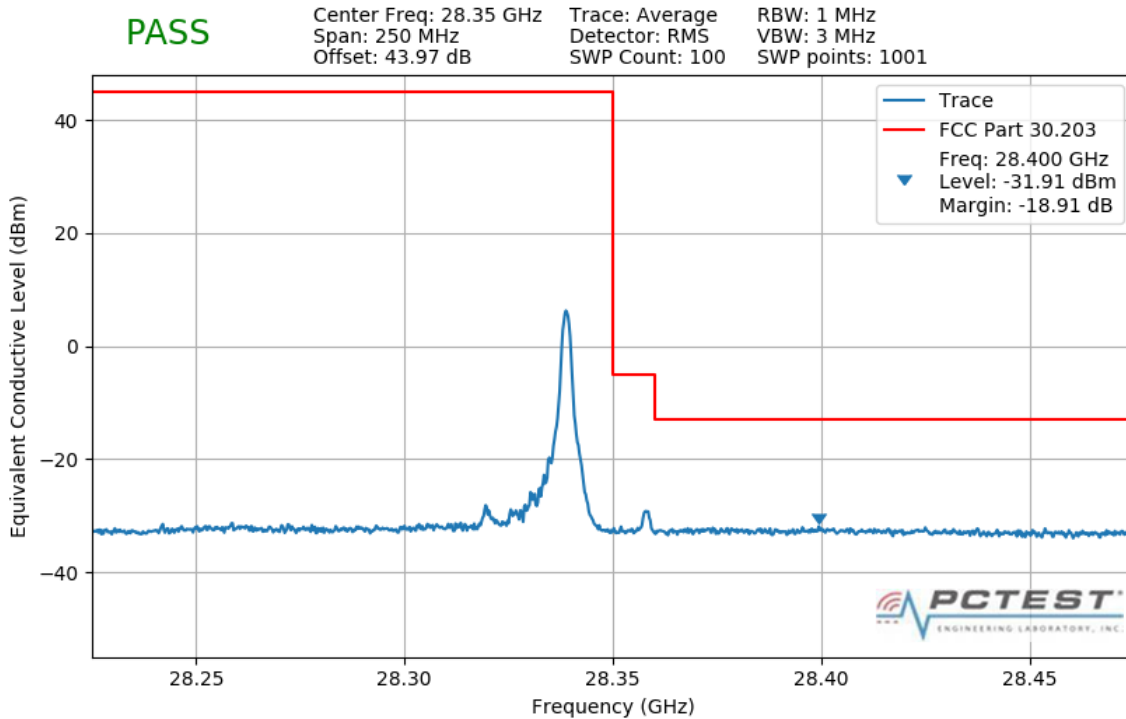


**Plot 7-236. Upper Band Edge Plot (1CC 50MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 165 of 337

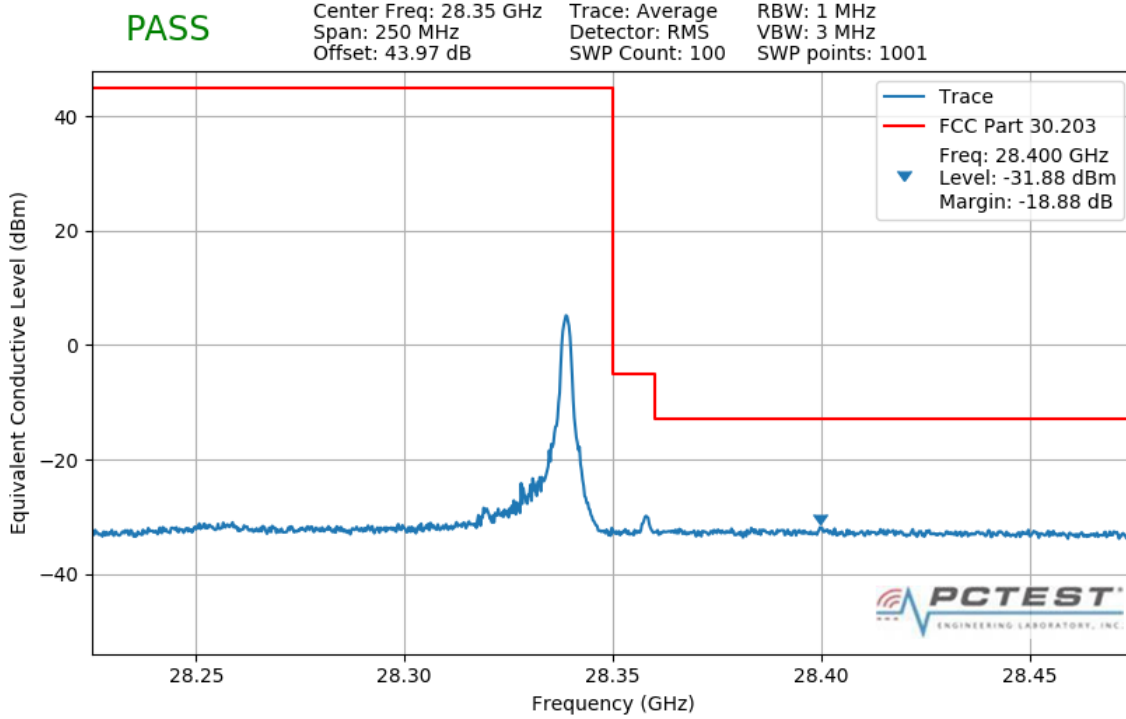


**Plot 7-237. Upper Band Edge Plot (1CC 100MHz QPSK Full RB)**

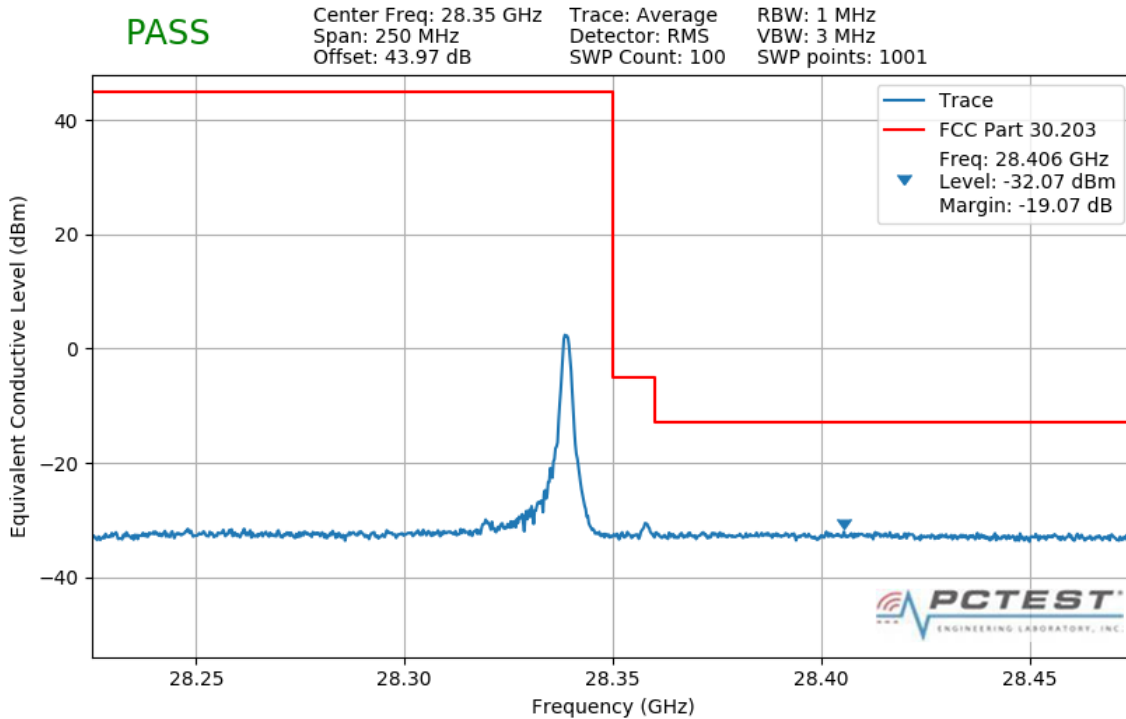


**Plot 7-238. Upper Band Edge Plot (1CC 100MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 166 of 337

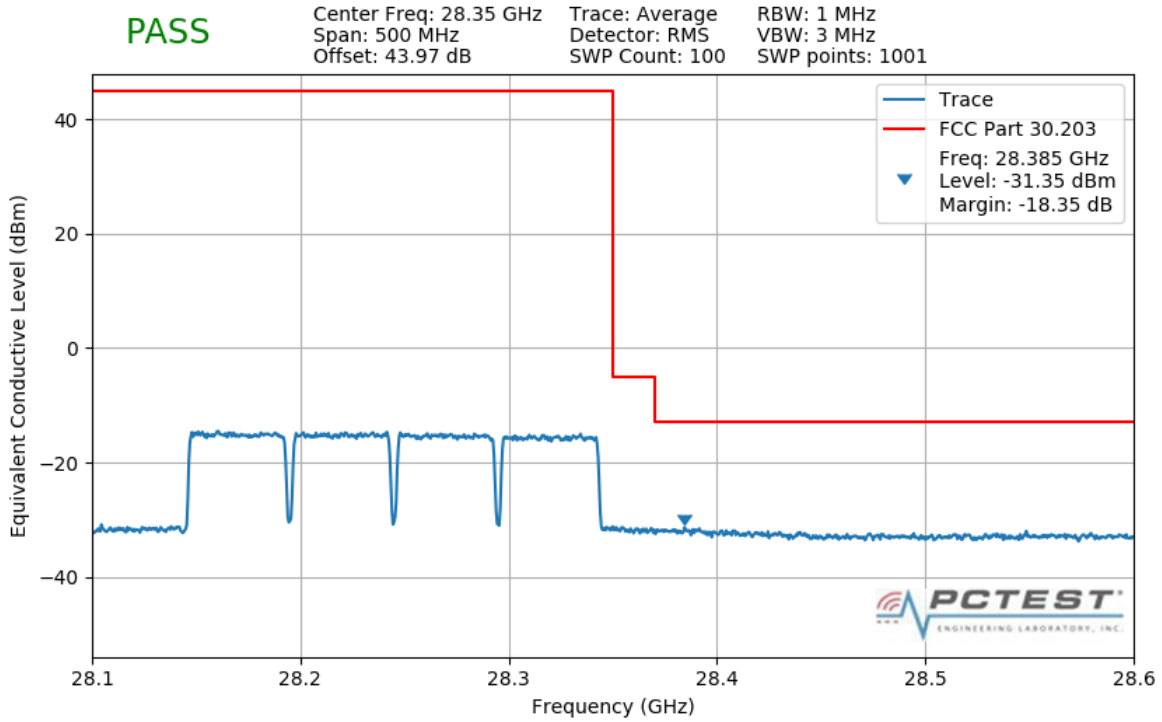


**Plot 7-239. Upper Band Edge Plot (1CC 100MHz 16QAM 1 RB)**

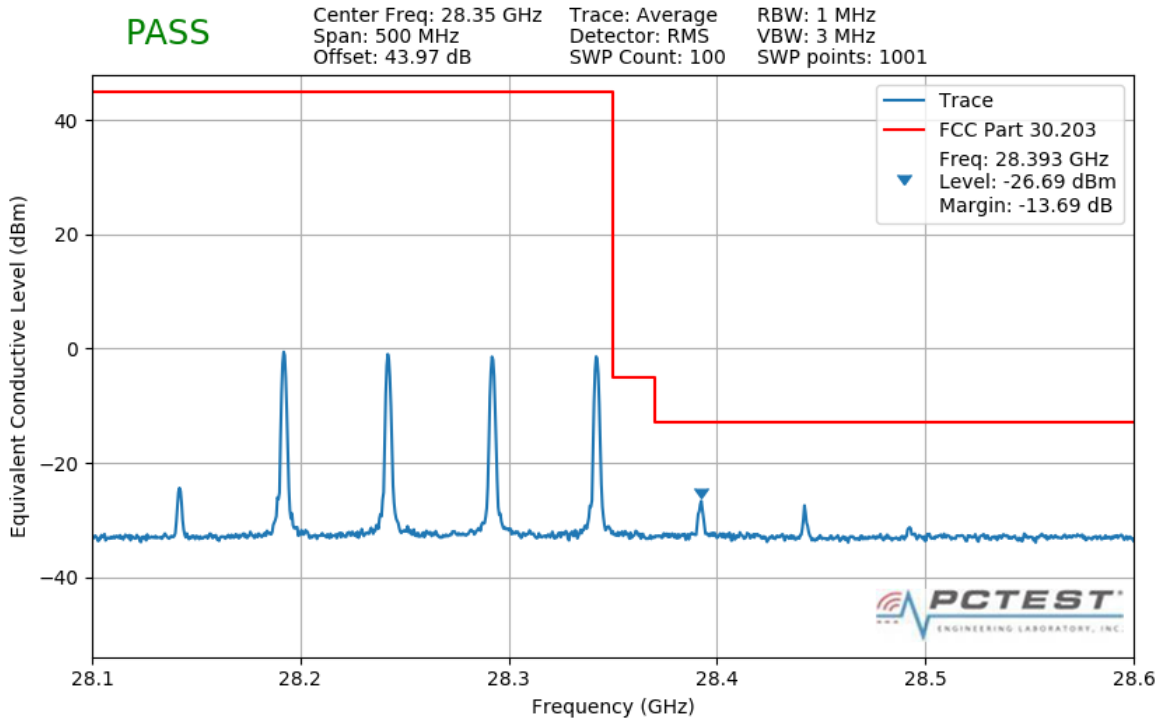


**Plot 7-240. Upper Band Edge Plot (1CC 100MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 167 of 337

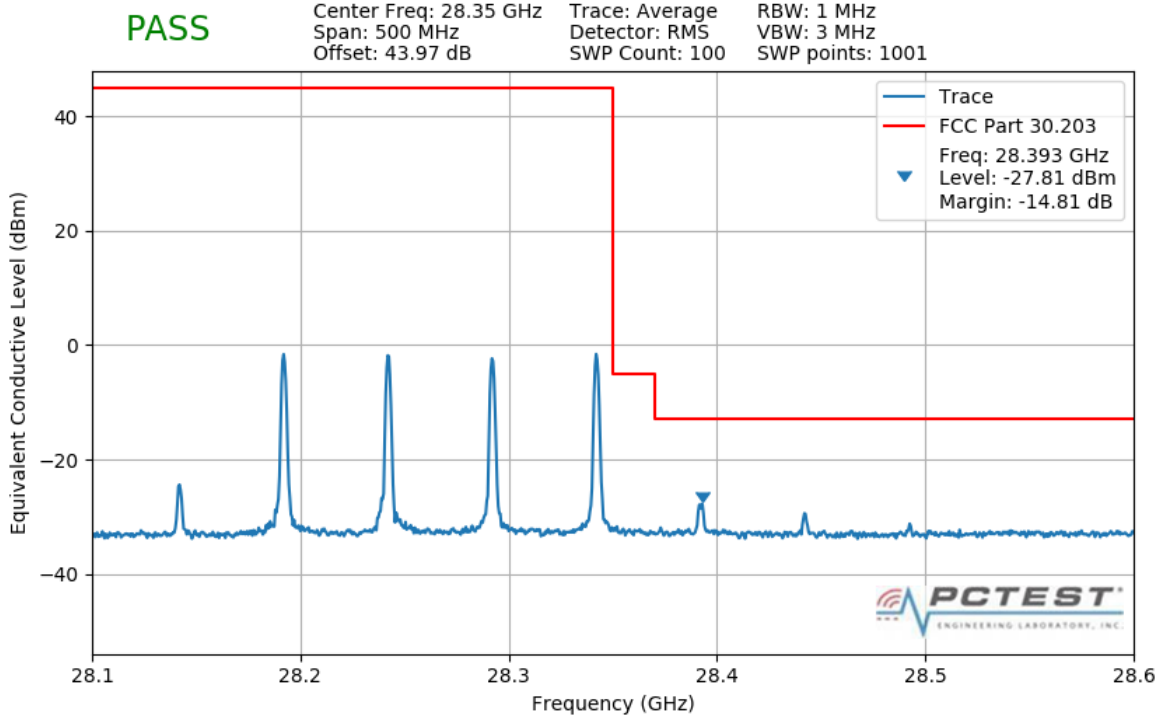


**Plot 7-241. Upper Band Edge Plot (4CC 200MHz QPSK Full RB)**

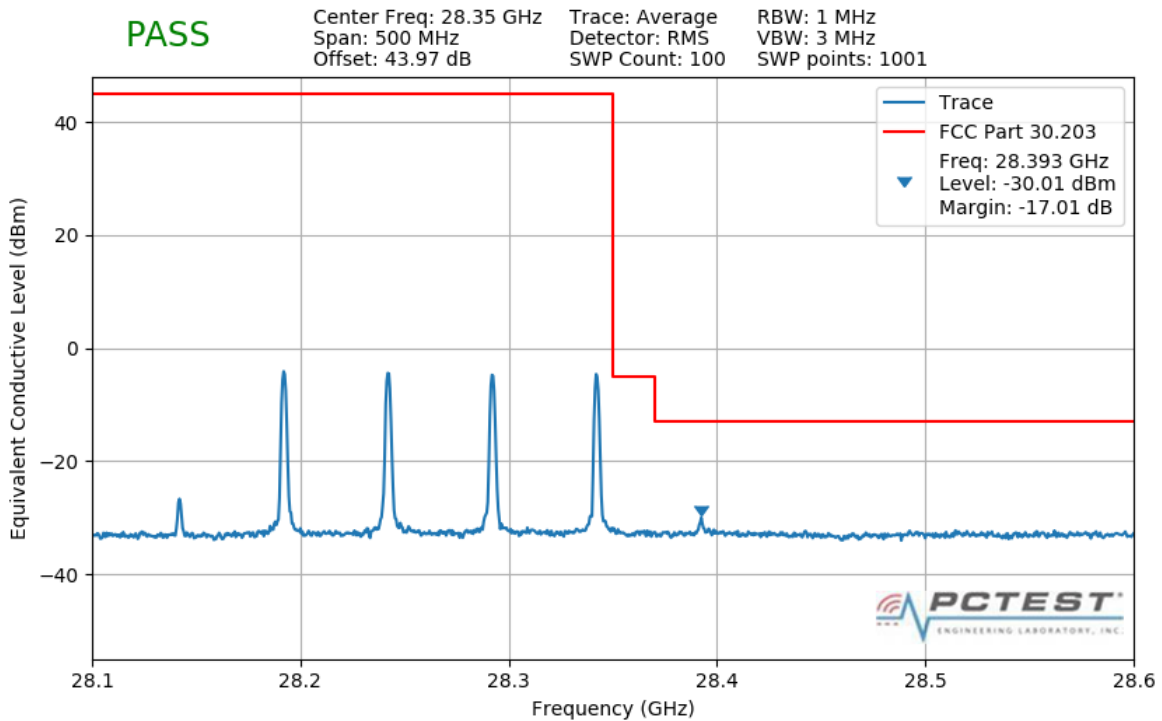


**Plot 7-242. Upper Band Edge Plot (4CC 200MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 168 of 337

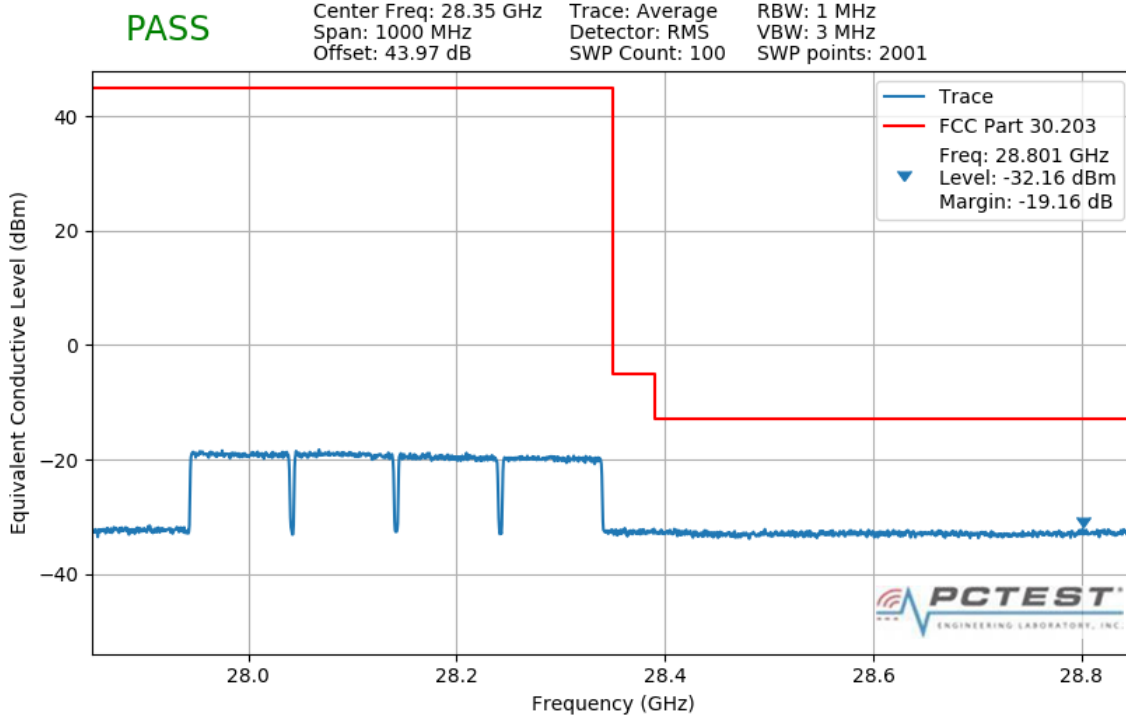


**Plot 7-243. Upper Band Edge Plot (4CC 200MHz 16QAM 1 RB)**

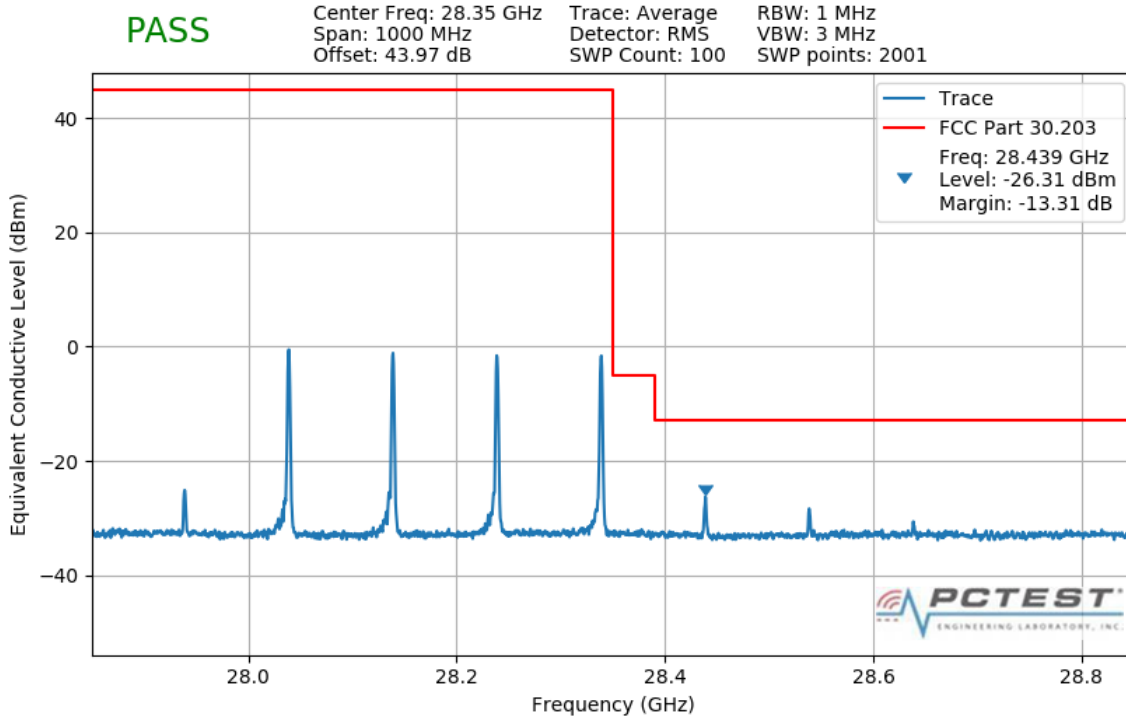


**Plot 7-244. Upper Band Edge Plot (4CC 200MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 169 of 337

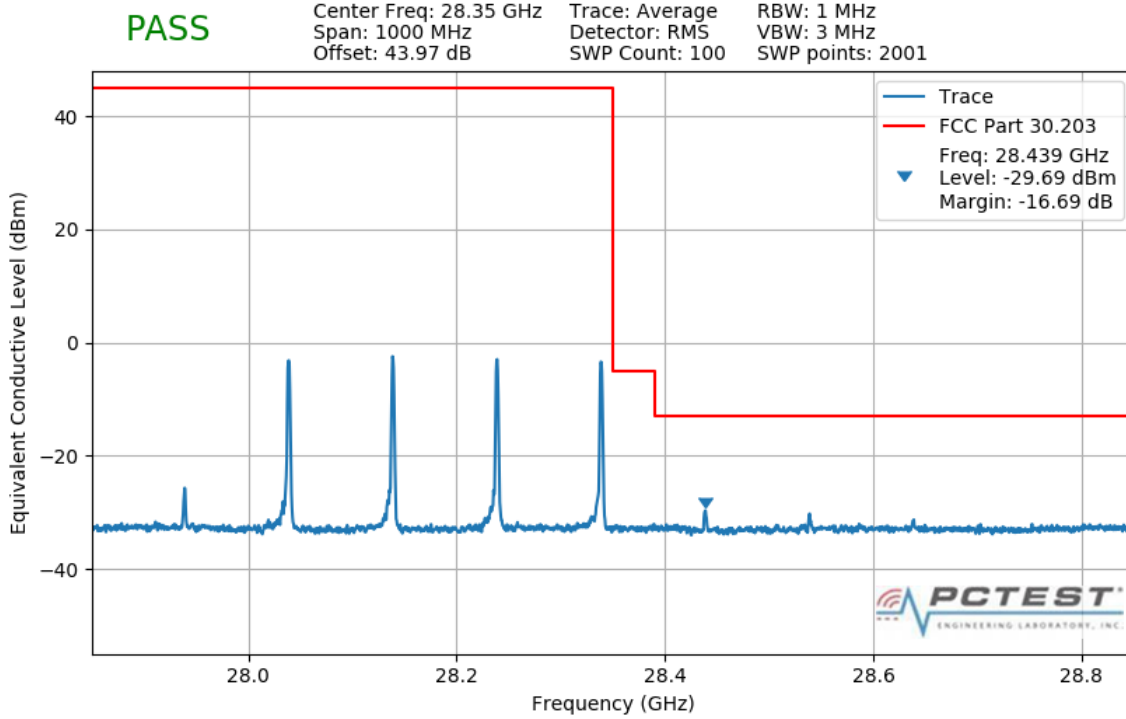


**Plot 7-245. Upper Band Edge Plot (4CC 400MHz QPSK Full RB)**

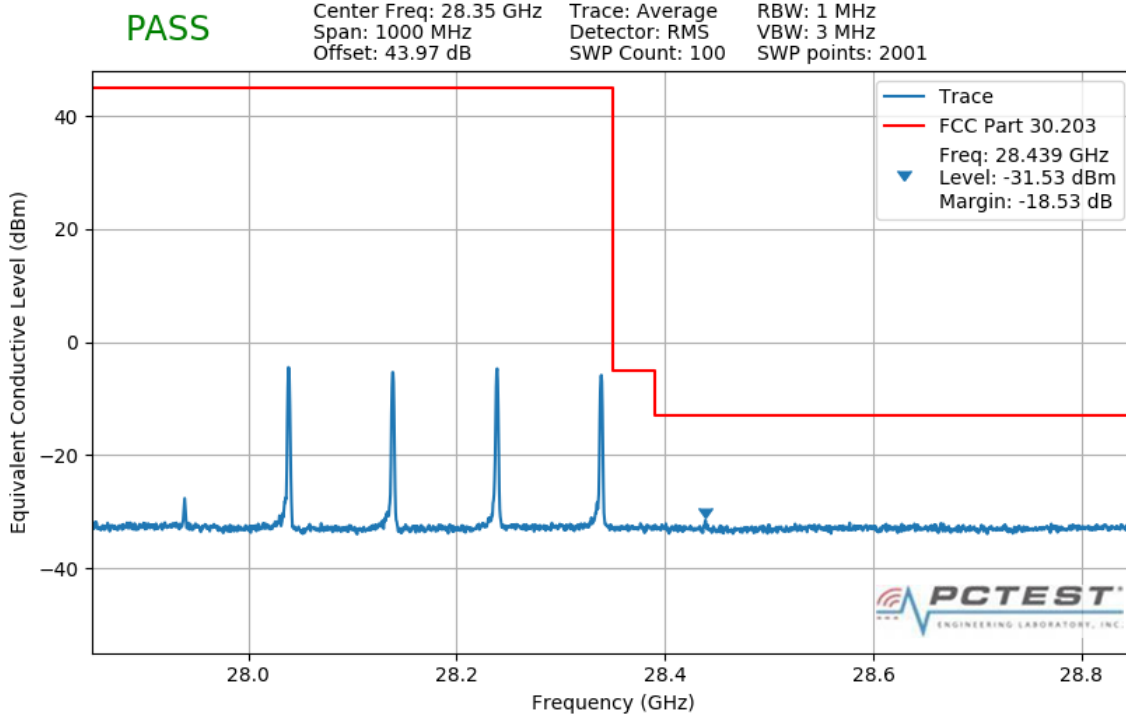


**Plot 7-246. Upper Band Edge Plot (4CC 400MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 170 of 337



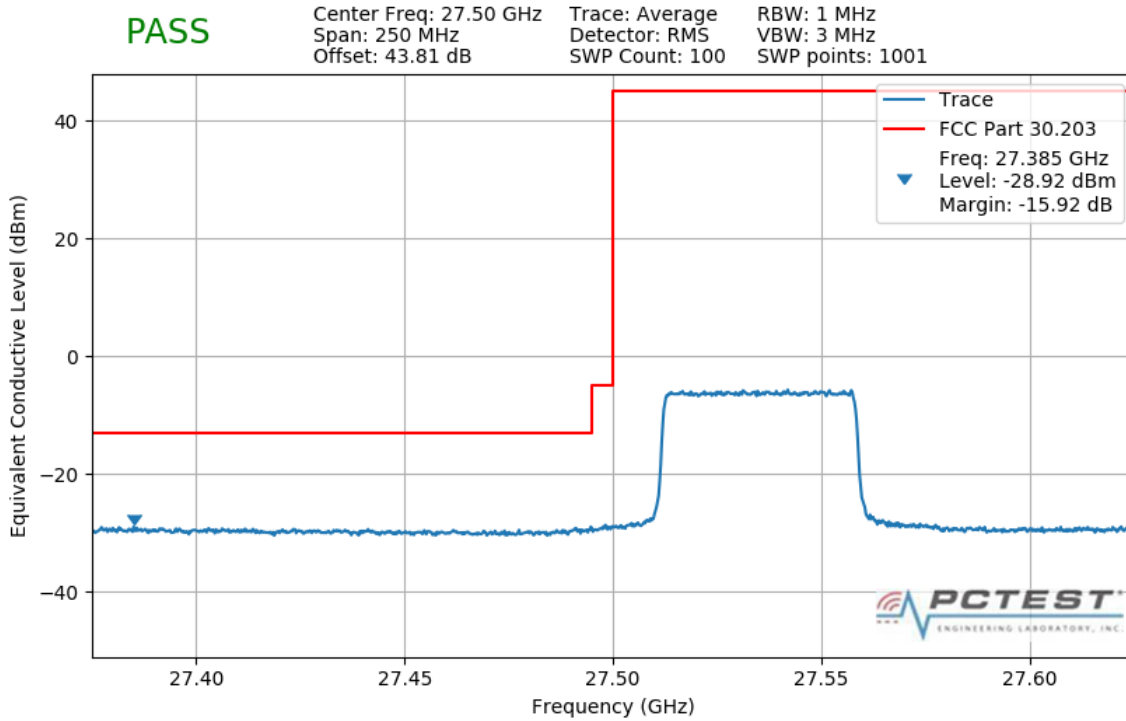
**Plot 7-247. Upper Band Edge Plot (4CC 400MHz 16QAM 1 RB)**



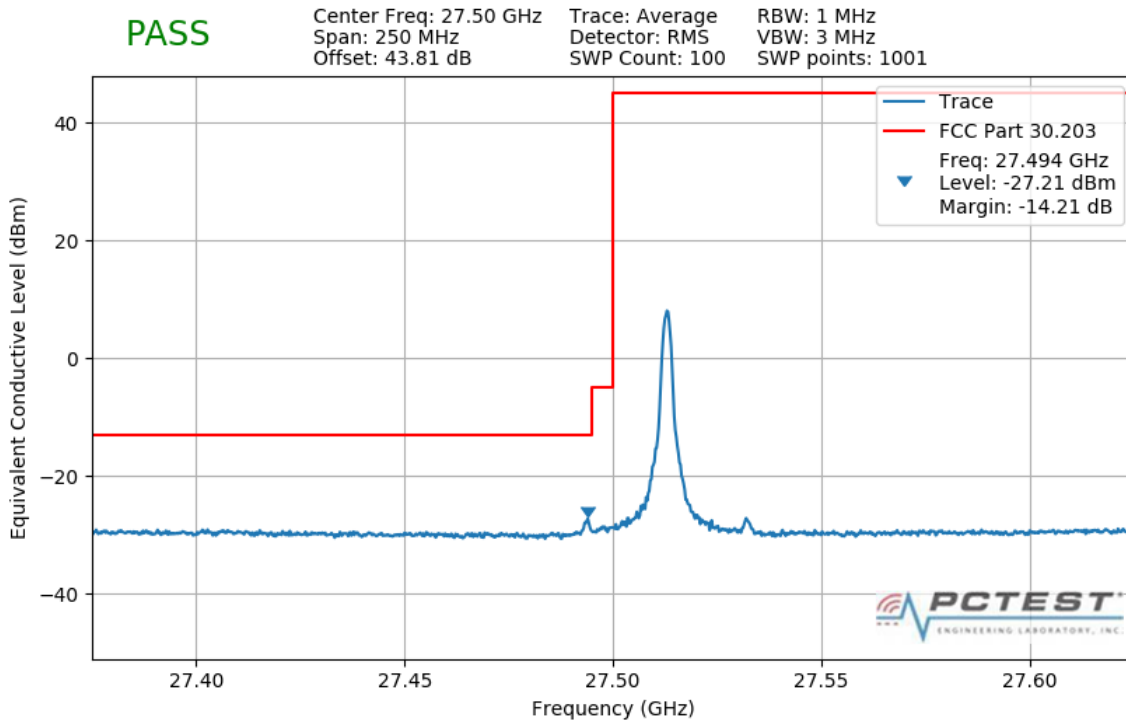
**Plot 7-248. Upper Band Edge Plot (4CC 400MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 171 of 337

**MIMO**



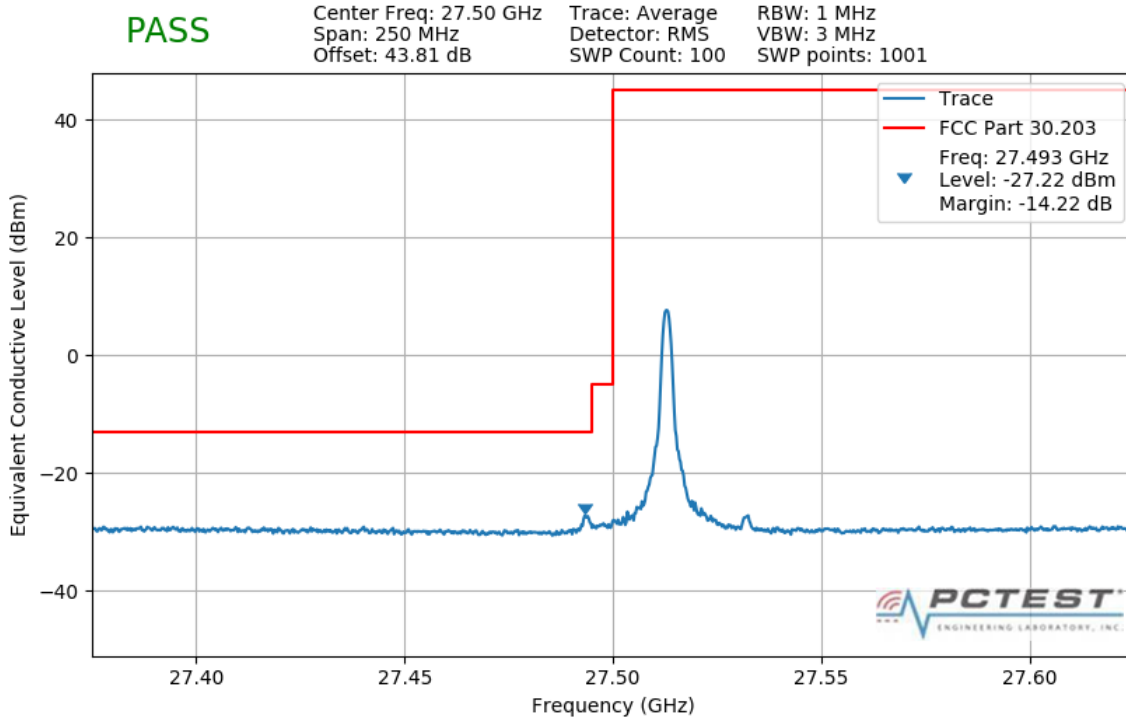
**Plot 7-249. Lower Band Edge Plot (1CC 50MHz QPSK Full RB)**



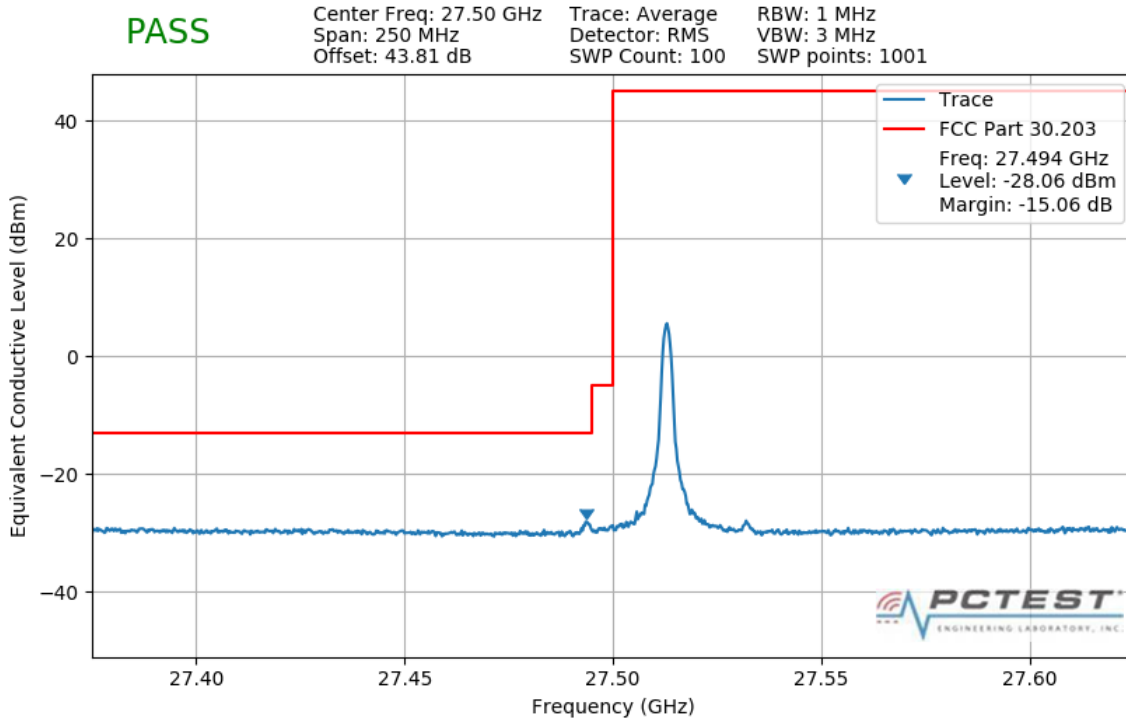
**Plot 7-250. Lower Band Edge Plot (1CC 50MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 172 of 337



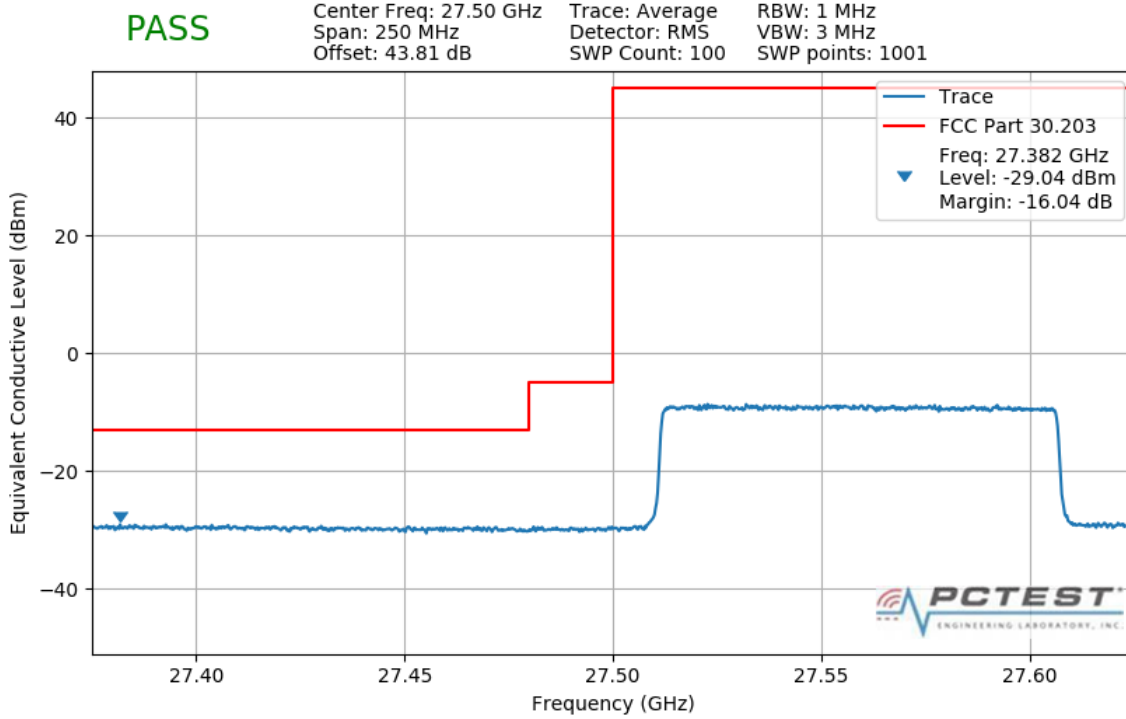


**Plot 7-251. Lower Band Edge Plot (1CC 50MHz 16QAM 1 RB)**

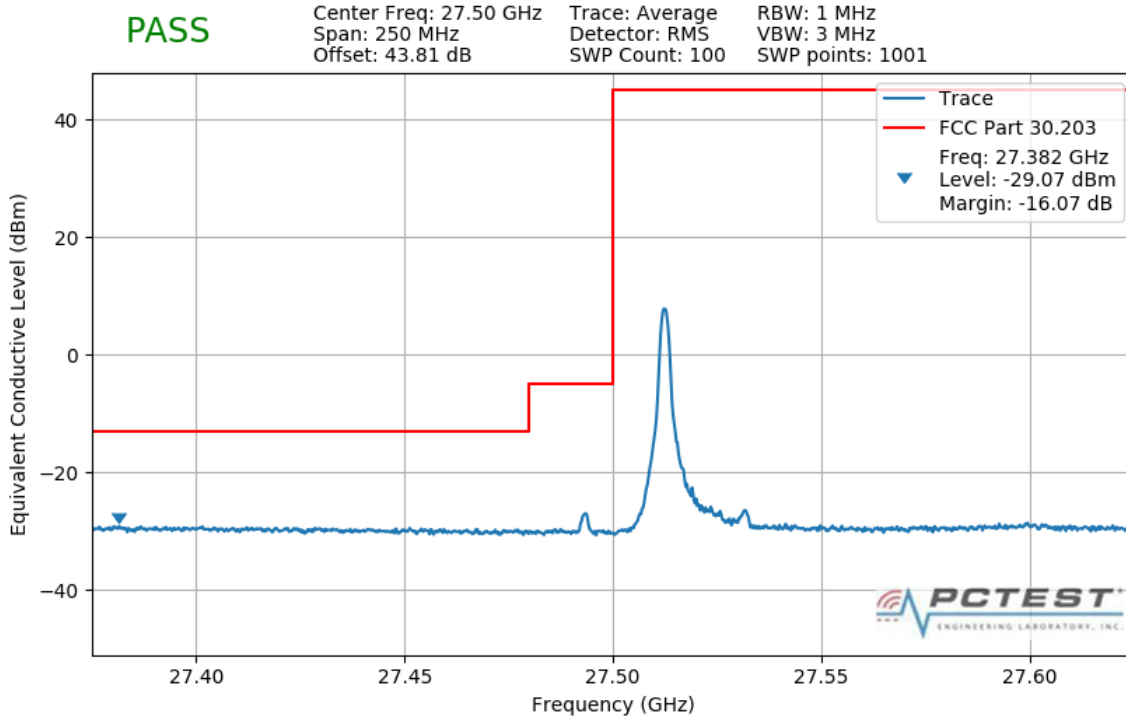


**Plot 7-252. Lower Band Edge Plot (1CC 50MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 173 of 337

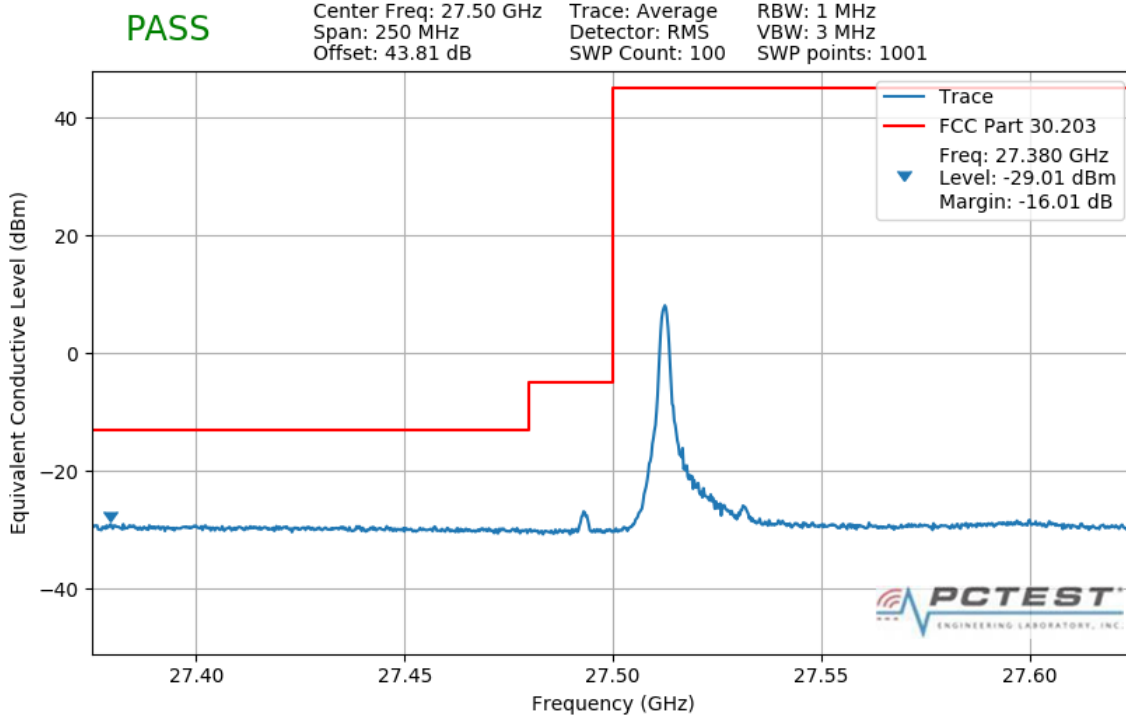


**Plot 7-253. Lower Band Edge Plot (1CC 100MHz QPSK Full RB)**

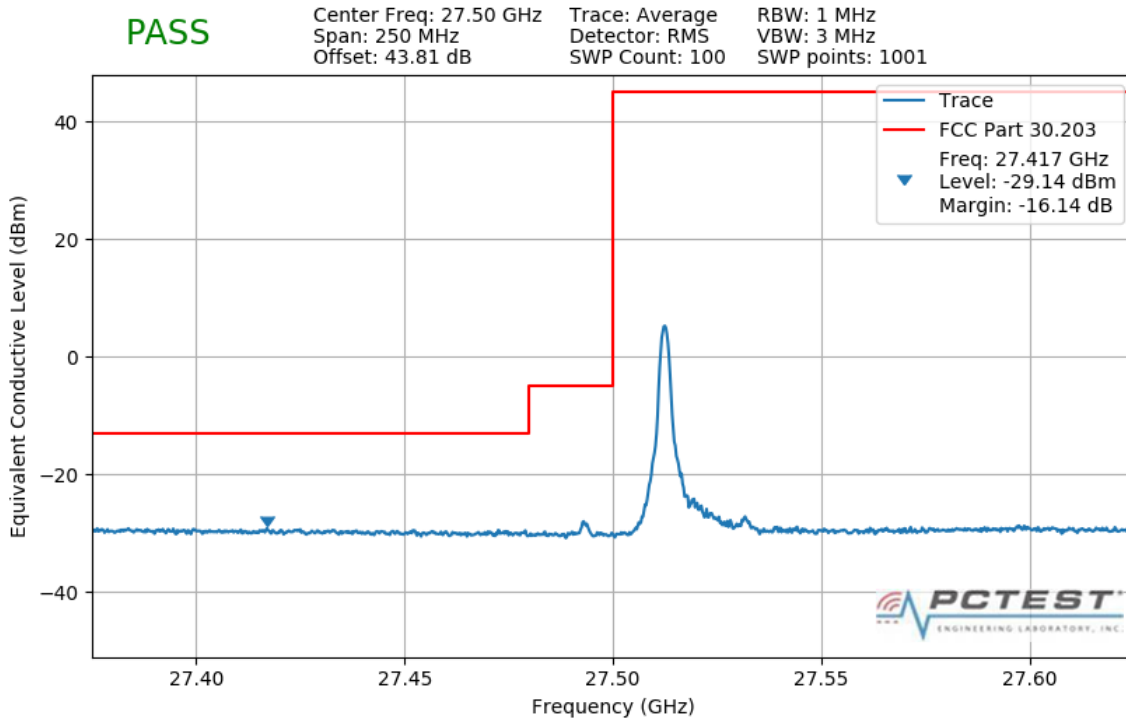


**Plot 7-254. Lower Band Edge Plot (1CC 100MHz QPSK 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset			Page 174 of 337

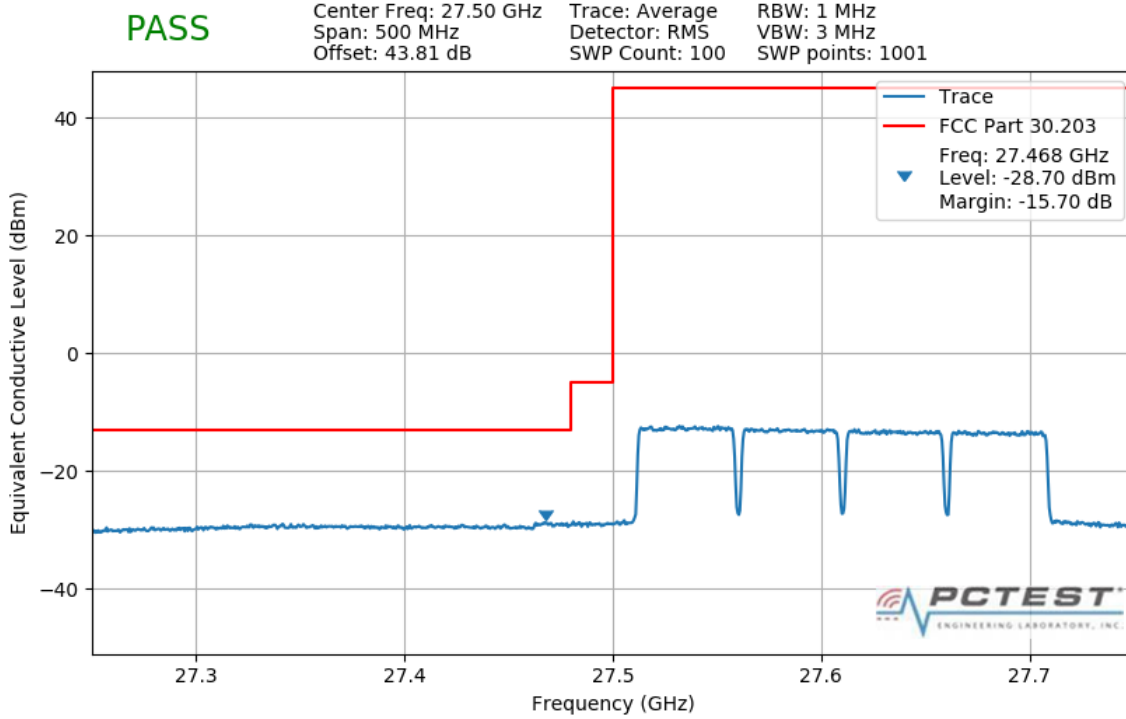


**Plot 7-255. Lower Band Edge Plot (1CC 100MHz 16QAM 1 RB)**

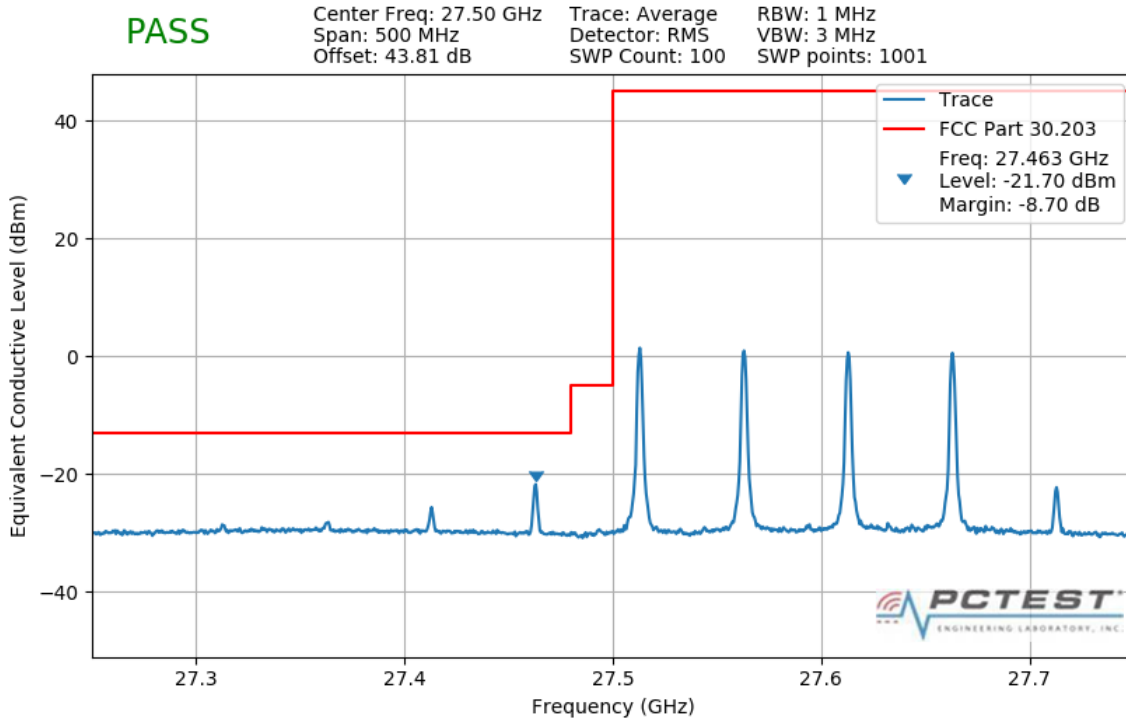


**Plot 7-256. Lower Band Edge Plot (1CC 100MHz 64QAM 1 RB)**

FCC ID: A3LSMG977U	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset			Page 175 of 337



**Plot 7-257. Lower Band Edge Plot (4CC 200MHz QPSK Full RB)**



**Plot 7-258. Lower Band Edge Plot (4CC 200MHz QPSK 1 RB)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-06-R1.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 176 of 337